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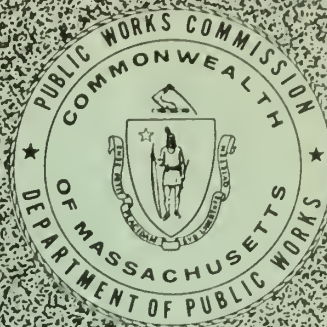
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July 1, 1972 - June 30, 1973



annual report

MASSACHUSETTS

DEPARTMENT

OF PUBLIC WORKS

Government Documents

Collection

DEC 20 1973

University of Massachusetts

BRUCE CAMPBELL

COMMISSIONER

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ASSOCIATE COMMISSIONERS

◀ **PUBLIC WORKS COMMISSION**



The Commonwealth of Massachusetts
Department of Public Works
Office of the Commissioner
100 Nashua Street, Boston 02114

October 31, 1973

His Excellency, Governor Francis W. Sargent
and the Great and General Court of the
Commonwealth of Massachusetts:

Gentlemen:

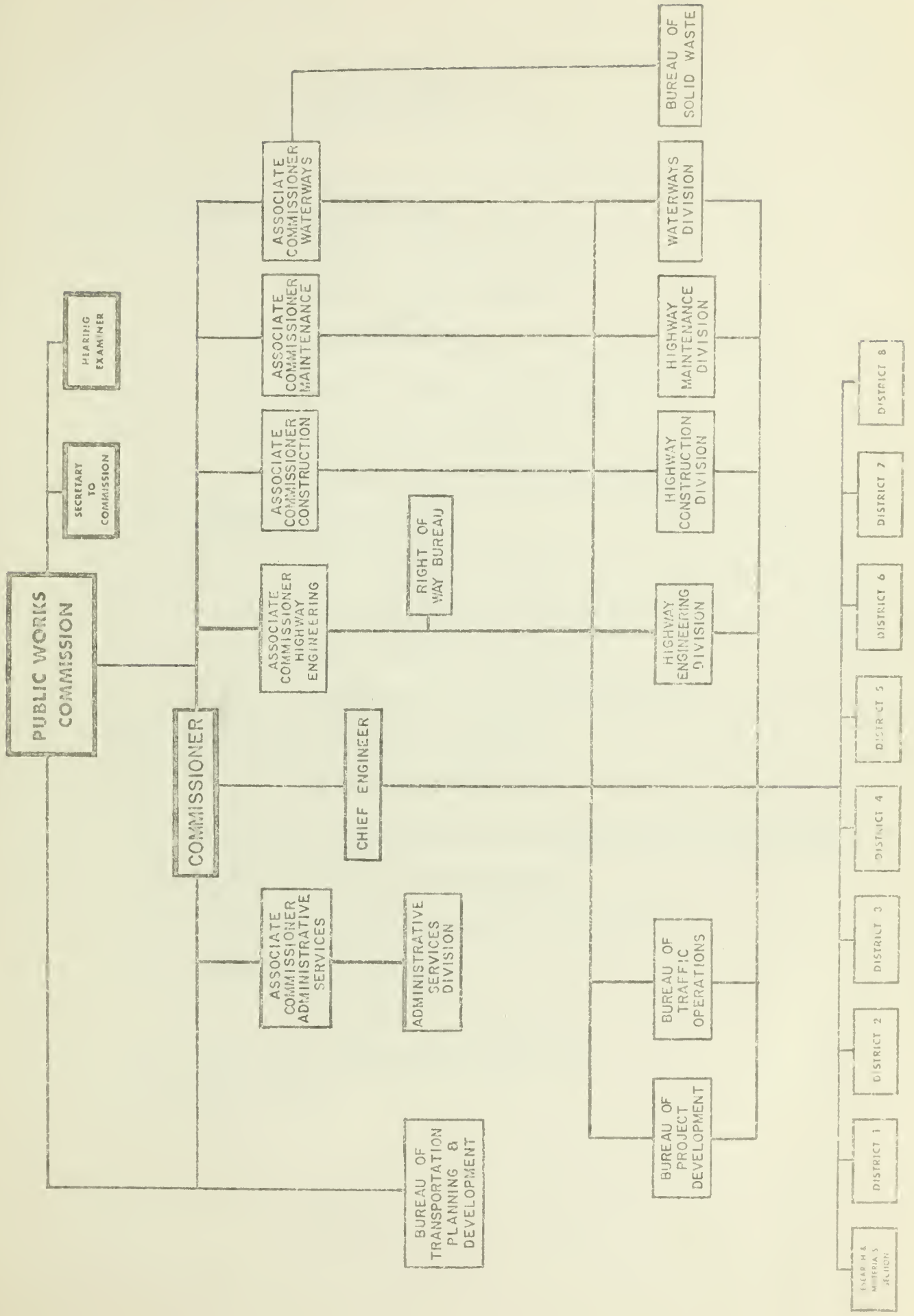
In accordance with Section 5 of Chapter 16, as
amended by Chapter 821 of the Acts of 1963, I herewith
submit the annual report of the Massachusetts
Department of Public Works for the fiscal year ending
June 30, 1973.

Very truly yours,

A handwritten signature in cursive script that reads "Bruce Campbell".

BRUCE CAMPBELL
COMMISSIONER

MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS



I N D E X

A. Highway Engineering

1. Highway Design Division
2. Right of Way Bureau
3. Bridge Section
4. Traffic Engineering Section
5. State Aid Section
6. Research and Materials Section

B. Highway Construction

1. Construction Section
2. Contract Engineer Section
3. Final Review Section
4. Procedures and Records Section

C. Highway Maintenance Section

1. Maintenance Section

D. Bureau of Transportation Planning and Development

E. Bureau of Project Development

F. Division of Administrative Services

G. Division of Waterways

1. Division of Waterways

H. Bureau of Solid Waste Disposal

I. Legislation

A

HIGHWAY DESIGN DIVISION, PLANS, ESTIMATES & FINAL SURVEYS

During the fiscal year ending June 30, 1973, preliminary surveys, plans, estimates and final surveys were made as follows:

FOR STATE HIGHWAY CONSTRUCTION

	<u>Cities</u>	<u>Towns</u>	<u>Miles</u>
Preliminary Surveys	8	17	36.3
" Plans	0	11	11.5
" Estimates	4	18	10.5
Final Surveys	0	7	43.8

FOR STATE HIGHWAY RECONSTRUCTION

Preliminary Surveys	11	42	79.2
" Plans	9	31	65.8
" Estimates	11	32	74.3
Final Surveys	1	10	30.8

FOR CHAPTER 81

Preliminary Surveys	0	3	1.6
" Plans	0	3	1.6
" Estimates	0	150	6933.9
Final Surveys	0	0	0

FOR CHAPTER 90

(Advertised & Unit Price)

Preliminary Surveys	8	34	38.3
" Plans	12	40	45.6
" Estimates	15	25	31.9
Final Surveys	3	15	17.0

FOR CHAPTER 90 CONSTRUCTION

(Force Account)

Preliminary Surveys	5	75	67.7
" Plans	3	57	42.1
" Estimates	12	163	208.4
Final Surveys	1	2	1.7

FOR CHAPTER 90 (Maintenance)

Preliminary Surveys	0	3	0.8
" Plans	0	4	0.9
" Estimates	2	161	1016.1
Final Surveys	0	0	0

HIGHWAY DESIGN DIVISIONSURVEYS, PLANS, ESTIMATES & FINAL SURVEYS (CONT'D)FOR ROADSIDE DEVELOPMENT

	<u>Cities</u>	<u>Towns</u>	<u>Miles</u>
Preliminary Surveys	0	0	0
" Plans	4	10	29.6
" Estimates	2	8	15.4
Final Surveys	0	0	0

FOR ACCIDENT PRONE

Preliminary Surveys	20	40	116.4
" Plans	5	84	12.8
" Estimates	26	27	159.8
Final Surveys	4	14	48.7

FOR RECONSTRUCTION SUB-STANDARD BRIDGES

Preliminary Surveys	4	10	6.1
" Plans	2	14	7.2
" Estimates	2	6	1.5
Final Surveys	3	9	2.2

NOTE:

No landscape & Scenic Enhancement Projects

No Control of Junk Yards Projects

No Topics projects included - to be submitted by

Bureau of Traffic Operations

HIGHWAY DESIGN DIVISIONPHOTOGRAMMETRIC SECTIONAERIAL SURVEYSRECONNAISSANCE PLANS

Scale 1" = 200' with 5' contours

Rte. 44, Seekonk-Swansea-Rehoboth-Taunton	25.0	square miles
Rte. 20, Springfield-Wilbraham-Palmer	10.0	" "
Clinton Connector to Route I-495		
Clinton-Berlin-Hudson	6.9	" "
Rte. 128, Reading-Wakefield-Lynnfield & Manchester-Essex-Gloucester	14.0	" "
Rte. 128, Weston to Elm Street Braintree	19.8	" "
Rte. 128, Danvers-Beverly-Wenham	7.2	" "
Rte. 27, Walpole-Canton-Sharon-Avon- Stoughton-Randolph-Brockton	20.0	" "
	102.9	square miles

STUDY PLANS

Scale 1" = 100' with 2' contours

Rte. 9, Framingham-Natick-Wellesley-Newton	7.09	square miles
Traffic Studies in Lowell	7.00	" "
	14.09	square miles

PRELIMINARY DESIGN PLANS

Scale 1" = 40' with 2' contours

Rte. 52, West Boylston to Rte. 2 in Leominster	21.10	Linear miles
Rte. 20, Center Street Bridge in Lee	0.40	" "
Rte. 20, Springfield	3.03	" "
Rte. I-93, Medford at Mystic Valley Parkway	1.43	" "
	25.96	Linear miles

"TOPICS" DESIGN PLANS

Scale 1" = 20' with 1' contours

27 sites in Framingham-Wellesley-Weston- Stoneham-Tewksbury	1.18	square miles
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MISCELLANEOUS

Approximately 100 telephone calls seeking information about photogrammetric mapping and aerial photography, the availability to obtain aerial photographs and/or mapping.

VIEWING AND HANDLING AERIAL PHOTOGRAPHS

Approximately 250 private individuals visited the office to view and pick out the respective aerial vertical photographs they might wish to purchase.

Approximately 350 requests from Departmental personnel and personnel from other governmental agencies to borrow aerial vertical photographs.

200 SCALE MAPS

Approximately 400 requests to furnish prints of 200 scale maps to Departmental personnel, Department consultants and to other governmental agencies.

HIGHWAY DESIGN DIVISION

LENGTHS OF STATE HIGHWAY LAID OUT FROM

JULY 1, 1972 to JUNE 30, 1973

STATE HIGHWAYS

8,456 additional miles of State highway were laid out in 4 Cities and 5 Towns.

2 Sections of State highway were discontinued in 2 Towns for a total of 1,333 miles.

36 State highway alterations involving no additional mileage were made in 10 Cities and 24 Towns.

The total length of State highway location on June 30, 1973 was 2669.369 miles.

ORDERS OF TAKINGS

108 Advance Order of Takings in 10 Cities and 17 Towns were prepared for proposed State highway locations, 1⁴ being taken in the City of Boston.

1 Maintenance Area was taken in 1 Town.

1 Drainage Area was taken in 1 Town.

1 Excess Land Area was taken in 1 City.

RIGHT OF WAY BUREAU

The activities of the Right of Way Bureau during the fiscal year 1973 continued its shift, begun a few years ago, from emphasis solely upon the acquisition of real property to make it available for construction, to a greater concern with environmental and human or social considerations. The terms "environmental," "human," and "social" denote an increased attention to the impact of a proposed highway upon natural resources such as wetlands, woodlands and parks, upon the family and the community, and upon such man-made institutions as schools, historical sites and housing concentrations.

In dealing with these newer goals of preserving valuable land areas and existing communities, the Federal Highway Administration promulgated new and expanded regulations, many of which cover the work of the Right of Way Bureau. Some are the newly revised and expanded PPM 81 series, promulgated under the Uniform Relocation Assistance Act of 1970; new Right of Way certificates applicable to acquisition and relocation activities not undertaken by the Department such as Topics (PPM 21-12); a new PPM 80-3 on appraisal procedures, and regulations dealing with noise standards and procedures as set forth in PPM-90-2.

The new concepts now require a greater concentration of effort during the period of planning the project, and more attention to family and business problems prior to and subsequent to acquisition.

An example of the extended activities which are carried on by the Right of Way Bureau may be noted in the Worcester I-190 project. In cooperation with the consultant on the job, the Right of Way Bureau developed a relocation plan at the conceptional stage (86 pages in length) which was attached to and became a part of the environmental

RIGHT OF WAY BUREAU

pact statement. Last resort replacement housing may have to be constructed for some of the 175 families which will be displaced by the project in order to meet Federal requirements for adequate relocation. Several functional replacement obligations have also arisen on this job. The Department has undertaken a program to assist in financing the additional cost for the construction of three new facilities that will be comparable to existing facilities which will be demolished in the course of relocation - the Greendale YMCA, the West Boylston Street School and the Registry of Motor Vehicles' branch office located in Worcester.

A more detailed summary of the activities carried on by the Right of Way Bureau follows.

The Right of Way Bureau, during Fiscal Year 1973, determined property ownerships, secured assessments, conducted interviews with property owners and tenants, prepared reports and carried out follow-up investigations in addition to providing Relocation Assistance and Property Management Services in connection with land and easement takings for numerous Interstate, Primary, Secondary, topics, Safety and Urban Systems projects, also on a railroad demonstration project involving approximately 80 cities and towns throughout the Commonwealth.

As a direct result of the Highway projects for Fiscal Year 1973, it was necessary to obtain Title Examinations on 660 properties. It was further required that 512 Title Rundowns be made on properties involved in Land Takings.

During 1973 Fiscal Year, 482 Staff Appraisals were prepared and 269 Fee Appraisals secured. In addition, the lease value of State-owned

RIGHT OF WAY BUREAU

land was determined on 4 properties. The Appraisal Review Section reviewed a total of 405 Staff Appraisals and 103 Fee Appraisals, in addition, established the lease value of State-owned land on 4 properties.

The Appraisal Review Section also reviewed appraisals on the Elizabeth Seton High School, Wellesley, \$5,484,000, St. Chretierine Academy, Salem, \$3,832,890, and the Northampton School for Girls, Northampton, \$500,000, as requested by the office of Administration and Finance.

The Massachusetts Real Estate Review Board reviewed 136 appraisals and established a value on 78 properties. They also determined the sale price on three parcels of land to be conveyed by the Commonwealth and determined the lease value on seven parcels of land to be leased by the Commonwealth. The Real Estate Review Board further reviewed the three cases involving the school properties for the office of Administration and Finance.

Overall, 955 parcels of land were acquired for Highway purposes during Fiscal Year 1973 at a total cost of \$6,811,050. In addition, the Attorney General's Office settled 72 cases for an amount of \$2,353,968 which represented an additional amount of \$820,317 over the Commonwealth original offer, bringing the total land acquisition cost for the Fiscal Year to \$7,631,367.

The Negotiation Section made offers in 541 cases. Negotiators also rendered assistance to the Land Damage Payment Section which processed 708 payments to property owners during the Fiscal Year; in 195 cases a final settlement was obtained with the property owners.

Furthermore, the Negotiation Section advised 69 owner-occupants

of their Replacement Housing additive and their Rental Replacement Housing amount and advised 56 tenants of their Rental Replacement Housing additive amount.

Replacement Housing additives were computed for 69 residential owner-occupied families and Rent Supplement additives were computed for 125 Residential occupants. In addition, 36 Replacement Housing additives and 47 Rent Supplement additives had to be recomputed because of the increased benefits entitled to relocatees under the 1970 Federal Highway Act.

During Fiscal Year 1973, Land Takings affected 104 families and 36 businesses. In this period, 82 families were relocated and 27 businesses moved to new quarters.

Two hundred sixty-one moving cost claims, both residential and business, were processed during the Fiscal year involving a total amount of \$249,784 replacement housing allowance claims totalling \$571,697 (average \$4,686) 173 rent supplement claims totalling \$241,661 (average \$1,281) and 198 dislocation allowance claims totalling \$30,370 (average \$153) were processed during Fiscal Year 1973. A total of 761 business and residential relocation claims were processed in Fiscal Year 1973 and the total relocation cost was \$1,100,704.

Relocation services rendered by Contract Agents in Boston and Fall River reflected a fiscal outlay of \$130,589.

In addition, because of the requirements of the 1970 Uniform Relocation Act, relocation plans were required for all projects and these were prepared by Department personnel. The level and priority

RIGHT OF WAY BUREAU

of relocation assistance has been given added emphasis and these requirements have resulted in a relocation section which consists of 31 Department relocation staff workers and contracts with the Boston Redevelopment Authority and the City of Fall River to carry out the responsibilities of the Department in this area.

The Advance Acquisition Section processed 72 cases in the Fiscal Year 1973.

Fifteen of these cases were taken by the Department in the public interest to prevent land development within a proposed highway corridor. The remaining 57 cases were taken after the Department had received a hardship request by the owners, in writing.

The seventy-two properties taken included forty-four residential properties, ten commercial properties and eighteen parcels of vacant land.

The total value of the properties acquired in Fiscal 1973 under the Advance Acquisition Program was in excess of \$2,500,000. At the end of the 1973 Fiscal Year, there were sixty-three cases under consideration for advance acquisition throughout the Commonwealth.

The Advance Acquisition Section also updated, on a parcel by parcel basis, the estimated right of way costs of the remaining 67 miles, more or less, of Interstate highway which totaled an estimated acquisition cost of \$105,000,000 in addition to Relocation costs of \$25,000,000. This Section further appraised the in-place value of 45 signs having an estimated value of \$160,000.

Property Management activities of the Bureau were extensive during the Fiscal Year 1973, as can be seen from the following figures:

RIGHT OF WAY BUREAU

During the Fiscal Year 1973, rentals under the Property Management Section of the Right of Way Bureau grossed \$290,426.00 with a net income after expenses of \$154,727.45. Sales of principal structures and improvements yielded \$51,406.31 and sales of land brought \$2700.00. Parking area leases produced \$2,950.00.

Additional leases netted \$201,424.01 bringing the total net receipts to \$413,207.77 for fiscal 1973.

During the year, 82 structures were acquired of which 58 were residential and 24 were commercial.*

During the same year, 135 were vacated and 146 structures were released for deomolition.**

*A total decrease of 26% over fiscal 1972, with a decrease of 37% in residential and a 33.3% increase in commercial buildings.

**An increase of 37.7% vacated of fiscal 1972 and an increase of 64% for demolition.

Comparison for fiscal <u>1972</u>		<u>1973</u>
Grossed Rental Income	\$226,471.63	\$290,426.00
Net Income after expenses	95,116.24	154,727.45
Sales of Structures	39,887.59	51,406.31
Sales of Land	2,180.00	2,700.00
Parking Area leases	35,234.01	2,950.00
Additional leases	184,884.60	201,424.01
<hr/>		<hr/>
Total Net Income	\$357,302.44	\$413,207.77

During Fiscal Year 1973, the Bureau's Federal Highway Administration Liaison & Compliance Section submitted documentation to support

RIGHT OF WAY BUREAU

a reclaim of \$120,371.40 made in connection with the F.H.W.A. audit deduction program.

Ineligibility findings by the F.H.W.A. in the amount of \$324,622.25 were resolved in favor of the Commonwealth.

In addition to routine meetings held with the Federal Highway Administration, many meetings were held relative to the Outdoor Advertising Sign Removal Program Policy for 1972 and the procedures to be followed on this activity.

A draft copy of the Bureau's proposed Right of Way Manual was reviewed and submitted to the Federal Highway Administration for their approval.

The following represents the activities of the Attorney General Liaison Section, Right of Way Bureau, Department of Public Works, for the Fiscal Year 1973.

Number of cases requested by the Department of the Attorney General totalled 121.

This Section also prepared 19 legislative bills which were introduced and heard by the 1972 Legislature. There were approximately 45 other Department of Public Works' bills for which the Section prepared written reports and appeared either for or against at various Legislative Committee hearings.

One of the major bills enacted during the Fiscal Year 1973 was Chapter 765 of the Acts of 1972, which became effective on July 17, 1972, known as the Accelerated Highway Act or Bond Issue.

This enactment directly affects the operation of the Right of Way Bureau since it expands the authority of the Department of

RIGHT OF WAY BUREAU

Public Works to "relocate persons residing in or carrying on business in, or to replace such dwellings or other structures, and to pay relocation benefits in amounts equal to levels of benefits provided for by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended."

During Fiscal Year 1973, the Right of Way Bureau's Training Program permitted ninety-seven (97) of our personnel to participate in courses of training. The breakdown is as follows:

Thirty-three attended and graduated from the Right of Way Institute, Suffolk University, Boston, Massachusetts, where they participated in advanced courses in Real Estate Acquisition, Real Estate Appraising, Relocation Assistance, Eminent Domain Law, Preliminary Engineering, Property Management and Photogrammetry.

Forty-two attended Right of Way Academy held at the Arlington District Office where they participated in special basic courses in Real Estate Acquisition, Real Estate Appraising, Relocation Assistance, Eminent Domain Law, Preliminary Engineering and Property Management.

BRIDGE SECTION

For the period beginning July 1, 1972 and ending June 30, 1973 the Department advertised the following for bids:

A. Construction, modification, and/or repaired, seventy-five structures - bridges, culverts and walls.

B. Addition of protective screening to various structures over:

1. Route 24 from Fall River To Stoughton
2. Route 2 in Arlington
3. Routes I-91 and I-291 in Springfield
4. Route 1 in Westwood

These seventy-five structures were included in thirty-eight projects. Seven projects were in excess of 1 million dollars.

1. Route I-93 widening from Reading to Andover) (5.6 M)
2. Route I-93 widening from Andover to Methuen)

The above projects involved the closing of bridge medians for public safety.

3. Construction of the Western Expressway in Fall River (2.7 M)
4. Construction of a section of Route 18 in New Bedford (1.8 M)
5. Construction of a new structure to replace the existing bridge on new alignment over the Merrimack River - Newburyport-Salisbury (11.8 M)
6. Construction of Route 52 in Oxford (2.9 M)
7. Construction of Route I-86 in Sturbridge (2.6 M)

Under the Substandard Bridge Program there were 8 bridges.

Under Chapter 90 there were 7 bridges.

The remaining projects were on State or Interstate Highway programs scattered throughout the Commonwealth.

BRIDGE SECTION

The Department has made preliminary studies and has initiated bridges at the following locations:

Primary

Route 25	Mansfield-Norton-Taunton-Raynham
Route 25	Plymouth-Bourne
Route 146	Sutton-Uxbridge
Route 6	Taunton-Somerset

Secondary

Route 116	Amherst-Hadley
By-Pass	

Sub-Standard

Routes 2A & Littleton	
110	
Longmeadow Road - Taunton	
Chapel St. over Reloc. B & M Railroad - Gardner	

Chapter 90

Grafton St. over Dorothy Brook - Millbury	
Main St. over Steamburg Brook - Northbridge	

Topics

Pedestrian Overpass - Essex St. and Rutherford Ave.	Boston
Mass. Ave. Widening over Huntington Ave.	Boston
Pedestrian Overpass - M.B.T.A.	Boston
Bailey Boulevard	Haverhill
Route 125 and 133 @ Senior High School	No. Andover
Everett St. under Penn Central Railroad	Norwood-Westwood
West Boylston St. over B & M Railroad	Worcester
Pedestrian Overpass - Belmont St.	Worcester

BRIDGE SECTION

Chapter 634, Acts of 1971, authorized the Department to accept transfer of all the railroad bridges within the State and "assume responsibility for the maintenance, repair, reconstruction, replacement or removal of any such bridges as may be necessary for the public safety and convenience."

The Penn-Central Railroad has transferred all of its bridges, 303 in number, to the Department. These are now being inspected by the Maintenance Division and 14 have been closed to traffic as of July 1, 1973.

It is anticipated that many will have to be replaced because structurally they are inadequate for present day traffic; or the alignments are very poor safety-wise or the width may be insufficient for the traffic load. How many will be replaced will depend upon appropriations by the General Court.

The Bridge Section designs, checks designs, and checks shop drawings for various Traffic Sign Contracts. These contracts for the fiscal year cost over \$1,300,000.

The Department continues to receive requests from Utility Companies to place utilities on existing bridges. Also, requests are received for permits to move overweight loads over bridges. In each case, the bridge involved is analyzed structurally to insure that the safety of the travelling public is not jeopardized by permits issued by the Department.

As authorized by Chapter 81 of the General Laws, the Department continues to provide advice, relating to public ways, to cities and towns. Under this arthorization the Department has inspected structures and made recommendations concerning their safety or suggested repairs.

BRIDGE SECTION

The Department's work includes inspection of steel fabrication plants and steel mills. Also two testing agencies have been assigned steel fabrication inspection amounting to 6150 tons.

BUREAU OF TRAFFIC OPERATIONS

Traffic engineering is defined by the Institut of Traffic Engineers as, "that phase of engineering which deals with the planning, geometric design and traffic operations of roads, streets and highways, their networks, terminals, abutting lands and relationship with other modes of transportation for the achievement of safe, efficient and convenient movement of persons and goods."

Over the past three decades, every aspect and function comprising this definition has experienced a continuously increasing rate of growth. The vital statistics for these aspects and functions for fiscal 1973 were no exception, in that all trend based projections were satisfied. This inclination indicates the enormous extent to which our nation has come to rely on highway transportation. The many implications of these aspects and functions as they relate to this highway oriented society of ours will become very apparent after reading the activities and responsibilities of the Units of this Section, as reported below for fiscal 1973.

BUREAU OF TRAFFIC OPERATIONSTRAFFIC ENGINEERING TRAINING

During Fiscal 1973 the Traffic Engineering Section continued its training program by arranging courses for numerous qualified personnel of the Department.

One graduate engineer from the Traffic Engineering Section, attended the Pennsylvania State University, Bureau of Highway Traffic and received his degree as Master of Engineering in Traffic and Transportation. The cost of this course was reimbursed 100% under a Federal Highway Administration Fellowship Grant.

Two of our young engineers received further undergraduate schooling at Lowell Technological Institute and University of Maine. One of these engineers received his degree in Bachelor of Science in Civil Engineering and has been accepted at Pennsylvania State University Graduate School. The cost of these undergraduate studies has been reimbursable under the Inter-governmental Corporation Act.

Two engineers completed a 10 day course on "Geometric Workshop at Northwestern University, Illinois, which was also a federally funded program.

Other courses in Traffic Engineering presented by Brooklyn Polytechnical Institute were held at the District 4 Headquarters in Arlington. These courses were attended by approximately 30 engineers and were completed in 10 days.

The personnel attending these various courses have provided greater knowledge and expertise to the Bureau of Traffic Operations in the application of the latest techniques for resolving traffic engineering problems.

SPEED CONTROL UNIT

A priority schedule for Speed Control Operations was continued in the fiscal year 1972-1973. Comprehensive engineering studies for each highway tested were employed using radar speedmeters to measure vehicular speeds, ball bank indicators to test each horizontal curve encountered and trial runs to evaluate the practicality of the maximum safe speed.

Forty-nine Special Speed Regulations were approved jointly by the Department and the Registrar of Motor Vehicles on State Highways, representing a total of 339.07 miles. Ninety-five Special Speed Regulations were approved by the Department and the Registrar of Motor Vehicles on 227 city and town ways.

Technical traffic engineering advice was given to 29 municipalities to aid them in their preparation to obtain Special Speed Regulations.

BUREAU OF TRAFFIC OPERATIONS

REGULATION SECTION

A most radical departure from the past procedure in processing municipal stop sign approvals was developed this year. To provide for quicker and more efficient service to Cities and Towns, the costly and time-consuming requirement of an original scaled plan of an intersection and a traffic volume count was eliminated. Instead three basic warrants were described in a form supplied to the municipality which could be certified by the Chairman of the Town Board of Selectmen or the City Clerk. This procedure was approved by the Commission on February 21, 1973. It was instituted practically at the same time as Commissioner Campbell's updated Stop Sign Program and the results have been excellent.

Regulatory advice to Cities and Towns and collaborating with other sections on Federal Aid projects, and high accident locations under Chapter 90, Section 33B of the General Laws continued as expected.

The report for the Fiscal year commencing July 1, 1971 noted a remarkable increase of one hundred per cent (100%) over the year before in the issuance of Permits for School Zones. This fiscal year commencing July 1, 1972 saw an increase of fifty percent (50%) over last year.

TRAFFIC ACCIDENT RECORDS PROJECT

The Accident Unit, in conjunction with the Data Processing Section, continued to refine the Department's Accident Records System.

Computer programs were rewritten to provide the capability of summarizing accidents by type, light conditions and weather conditions. This summary was further updated to collate accidents according to the day, hour and month of occurrence thus highlighting hourly, daily and seasonal variables.

Refinements were made during the year to the Department's High Accident Location Program. This program now has the capability of listing, in decreasing order, accidents at intersections on a accident per million vehicles (Acc./MV.) basis, and at highway links on an Accident per million vehicle mile (Acc./MVM) basis.

These refinements provide the Department with an additional tool for establishing priorities for locations to be improved through safety projects. Also, it provides management with a more realistic picture as to where expenditures of funds for projects should be channeled.

Accident record data from these programs have been used extensively by Department personnel and consultants as well as by law enforcement agencies.

Projects being developed include a study to determine the effects of shoulder width on accident rate and a model to forecast accidents according to facility type.

TRAFFIC ACCIDENT RECORDS PROJECT (cont'd)

Under consideration is the use of the Department's plotter to assist in the plotting of accident diagrams.

ACCIDENT UNIT

The Accident Unit has among its major responsibilities the continual updating of the Computerized Traffic Accident Records System. During the year the Department has begun the task of updating the county series maps by plotting mile marker locations along State Highway Routes. Eventually, this mile marker data will be incorporated into the Accident Records System so crashes may be accurately located.

Fatal crashes were analyzed to determine the relationship of roadway conditions to the crash.

The Department also published its Seventh annual report of "State Highway Fatal Motor Vehicle Accidents". As in the past, the publication is a statistical presentation of all factors involved with Fatal accidents which have occurred on the State Highway System.

BUREAU OF TRAFFIC OPERATIONS

B.U. LAW-MEDICINE RESEARCH PROJECT

The Traffic Engineering Section is continuing in its participation in the Boston University Multi-disciplinary Traffic Accident Research Project.

In keeping with the in-depth nature of the project, this Section contributes highway engineer expertise in conjunction with the automotive medical, legal and psychological phases of the project. Monthly meetings are held, at which time all team members are present to review and pass comment on individual cases. All team members, regardless of specialty are encouraged to discuss how various safety measures could be utilized now and in the future.

The project is funded by a Federal grant from the Department of Transportation which has a year to run before it comes up for renewal.

BUREAU OF TRAFFIC OPERATIONS

TOPICS

The Traffic Operations Program to Increase the Capacity and Safety of urban streets was established by the 1968 Federal-aid Highway Act to encourage municipalities to accelerate their efforts to reduce traffic congestion, facilitate the flow of traffic and reduce accidents. This program provides Federal-aid of 50% of the cost for the study, design and construction of "TOPICS" type improvements. The Department of Public Works provides the remaining 50% of the cost. The municipalities are responsible for land acquisition and the maintenance and operation of the traffic improvements when completed.

The type of improvements eligible under TOPICS are signalization and channelization of intersections, traffic signal control systems, minor widenings, transit turnouts and shelters, pedestrian grade separations, elimination of at-grade road crossings, fringe parking facilities, highway lighting, and other improvements to increase the capacity and safety of traffic.

To initiate TOPICS in a community, several steps are required. 197 communities are eligible in Massachusetts. Eligibility is based on the population density of the community. 168 communities including the Metropolitan District Commission have expressed an interest in the program. The first step is for the community to sign a general TOPICS agreement with the Department in which the community agrees to abide by Massachusetts traffic regulations for TOPICS projects. 165 communities including the MDC have executed this agreement with the Department. The next step is to develop a Type II system for a

BUREAU OF TRAFFIC OPERATIONSTOPICS (CONT'D)

community which system outlines the streets eligible for TOPICS improvements. The Type II system of a community would include the heavily traveled streets. Boston has been divided into 8 sub areas for easier analysis. 171 Type II systems including 8 in Boston have been developed jointly with our District offices and each community. Next, an area wide TOPICS plan for each community is prepared. This is an engineering study of the community's traffic problems with recommendations for an improvement program. 166 Areawide TOPICS Plan work program and budgets have been submitted. 150 proposed areawide TOPICS plans have been prepared. 2902.0 miles of urban streets have been approved as Federal-aid Primary Type II System. 123 Final Areawide TOPICS Plan have been submitted.

While the Areawide plan is underway TOPICS projects in a community may be advanced to design and construction. 74 Eligibility Statements briefly describing the scope and location of a proposed project have been submitted. To analyze the need and features of a project a functional design project report is prepared. 96 Project Reports have been prepared.

Upon review and acceptance of the project report, the design of a project is initiated. 150 design budgets have been submitted. In order to prepare adequate base plans field topographic survey must be obtained for the project location. 195 requests for survey have been transmitted. 95.0 miles of base plans have been plotted for 110 projects - 75% preliminary design plans for 90 projects have been submitted. Plans, Estimates, and Special Provisions have been prepared for 62 projects with a construction volume of \$25,560,000.

BUREAU OF TRAFFIC OPERATIONS

TOPICS (CONT'D)

66 traffic control agreements, 11 railroad force account agreements, 7 utility company force account agreements, and 5 municipal betterment agreements for these projects.

The TOPICS Section has been transferred to the Bureau of Traffic Operations. Support has been provided by the Traffic Engineering, Highway Design, Bridge, and Planning Sections and District Offices. The initial TOPICS projects have been designed in-house. This way, the routines and procedures for progressing the designs of TOPICS projects have been clarified for this Federal-Aid Community oriented program. Design engineers have been engaged to aid the Department in advancing projects with the Department staff responsible for final review of TOPICS projects.

During the next eighteen months the Department has set up a TOPICS program to advertise 80 projects with a construction volume of 36.5 million dollars.

Our natural progression has now led us into the next phase of the TOPICS Program; namely, that of evaluating selected projects to determine the extent and efficiency of our improvements.

The Traffic Engineering Section is currently preparing a suitable program and methodology for performing that function and would expect our first completed analyses within the coming year.

LOCAL STATE AID SAFETY IMPROVEMENT PROGRAM

Chapter 90, Section 33B of the General Laws was instituted for the express purpose of eliminating accidents at high accident locations by installing traffic control devices.

During fiscal 1973 the Traffic Engineering Section continued administering applications submitted by the municipalities for safety improvements at their high accident locations.

The following is a summary of the status on June 30, 1973 of the various projects approved since the inception of this program on June 10, 1972.

<u>PROJECTS COMPLETED</u>	<u>COST</u>
5	\$40,000
<u>Project under construction</u>	<u>COST</u>
22	\$340,000
<u>Projects being advertised for bid</u>	<u>Est. Cost</u>
17	\$200,000
<u>Projects under design by Consultant Engrs.</u>	<u>Est Cost</u>
13	\$300,00
<u>Projects under design by Local Communities</u>	<u>Est. Cost</u>
20	\$400,00

The Traffic Engineering Section is reviewing possible ways of gaining greater response from local communities in this program initiated for reducing accidents on our local roadways. The various problems concern this programs reimbursement feature, the smaller towns inability to design a proposed improvement as well as preparing contract data suitable for advertising. It is essential that greater efforts should be made in creating a more effective program for reducing accidents on our local roadways.

CHAPTER 616, SECTION 6, ACTS OF 1967

In 1967, the Legislature provided a fund of \$3,000,000 with which the Department could reimburse the local communities for 100% of the total cost for installing school zones under Chapter 616, Section 6. This installation provides for a special flashing sign that establishes a legal speed limit of 20 m.p.h. during the hours children would be going to or coming from school.

Since the inception of this program 160 school zones have been constructed at a cost of \$500,000. Another 90 installation are presently under construction at a cost of \$300,000.

Permit applications have been received from 70 communities for constructing school zones at 140 locations. Permits have been issued for these installations.

BUREAU OF TRAFFIC OPERATIONSANNUAL HIGHWAY SAFETY WORK PROGRAM (AHSWP)

During Fiscal 1973 the Traffic Engineering Section implemented the following projects under grants from the Federal Highway Safety Act:

(A) DEPARTMENT PROJECTSFederal Funds

1.	Engineer Training American Public Works Association Seminar at Boston	4 men	260.00
	AASHO Photologging Seminar at Washington DC	2 men	420.00
	University of Wisconsin Bridge Maintenance Seminar	1 man	313.00
	Northwestern University Highway Design Seminar	3 men	2,631.00
	Scuba Diving Training at Mass. Maritime Academy and Topsfield Academy	25 men	3,860.00
			<u>\$7,484.00</u>
2.	Bridge Inspection Program Purchase of equipment for bridge inspection		7,796.00
	Purchase of diving equipment for under water bridge inspection		7,770.00
		Total =	<u>\$15,566.00</u>
3.	Accident Records Program Salaries for Clerk Stenographer and Computer Systems Analyst		18,238.00
	Rental of Scan Machine for accident locations		692.00
		Total =	<u>\$18,930.00</u>
4.	Photologging Program Purchase of truck van, cameras projector, film, editing, office and miscellaneous equipment		
		Total =	\$34,354.00
5.	Manual on Uniform Traffic Control Devices (MUTCD) Compilation and distribution of the Departments 1972 MUTCD		
		Total =	8,100.00

(AHSWP - CONT'D)

6. Skid Test Program

The Department received a skid test vehicle in June 1973. Cost of machine was included in the fiscal 1973 program. Department should have a skid test program in operation during fiscal 1974.

Total for A (project 1 through 5)
= \$84,434.00

(B) COMMUNITY PROJECTS

1. Purchase of Pavement Marking Equipment
for 6 cities and towns Total = \$45,666.00

2. Purchase of Warning and Regulatory Signs
for 10 cities and towns Total = 57,952.00

3. Purchase of Traffic Counters and Radar
Meters for 4 cities and towns Total = 9,900.00

Total for B (projects
1 through 3) \$112,618.00

Grand total (A & B) = \$197,252.00

The Traffic Engineering Section submitted to the Governor's Highway Safety Bureau 15 subelements for fiscal 1974 AHSWP requesting Federal funds of over \$500,000.00 under the Highway Safety Act.

BUREAU OF TRAFFIC OPERATIONS

STOP SIGN PROGRAM

I. Funding: Accelerated Highway Funds

A. Purpose

1. Update and facilitate investigation of requests and the processing of stop sign permits for cities and towns.
2. Legalize existing unauthorized stop signs statewide where warranted.
3. Education of municipal authorities to updated system.

II. Scope: 172 cities and/or towns participated in the program in the first six months (Jan.-June), since its inception.

2,000 individual intersections investigated by Department personnel.

1,800 Isolated Stop Sign permits issued (Incl. State Hwy.)

1,655 signs and supports provided to 67 cities and towns.

The major change is the simplified permit form which Precludes the need for a formal traffic count, engineering drawing and collision diagram. This was a virtual impossibility for some communities and costly for the others. The Department - community good will developed during this program, cannot be measured in dollars.

BUREAU OF TRAFFIC OPERATIONSTRAFFIC SIGNS AND PAVEMENT MARKINGS UNIT

I. Operational Summary:

A. Signing

1. Contract - Design and/or review of signing on construction and reconstruction projects awarded under bid contracts.
2. Force Account - Design and/or review of new or replacement signing totally on an in-house basis.
3. Experimental Signing
4. Special Signing
5. Sign Processing

B. Pavement Markings

1. Contract-Review of markings designed by others on construction and reconstruction projects awarded under bid contracts.
2. Force Account - Design and detail undertaken entirely by Department forces.

C. Specifications and Standards - Prepared by this unit for signs and markings on all projects.D. Route Changes and Route DescriptionE. MiscellaneousII. Signing

During the fiscal year the Unit has handled a volume of work encompassing all projects designed by the Highway Design Section, District Project Offices and consultant engineers under contract to the Department. The money value of signing on these projects is approximately 3,500,000.

The Unit is responsible for designing, signing and/or reviewing designs of others, for directing the motorists to geographic areas serviced by the State Highway System.'

Force Account Signing on in-house projects were designed and/or reviewed by this unit on about 175 individual projects throughout the Commonwealth. The money value for these projects is approximately \$265,000.

The unit has reviewed over 50 TOPICS Projects the past year of which signing and pavement markings have been major features. 25 more projects are scheduled to be advertised this summer.

Experimental signing this past year consisted of evaluation of diagrammatic signing on a limited basis. In 1972 Diagrammatic signing was installed at the Route 2 interchange with Route 111 in Athol as part of a Safety Signing and Lighting Contract. These signs have been

TRAFFIC SIGNS AND PAVEMENT MARKINGS UNIT (CONT'D)

erected and their effectiveness is presently being evaluated. Experimental signing on high intensity sheeting and legend sizing on Routes 9 and 30 in the Wellesley-Weston area have been favorably evaluated and included in the Standard Specifications.

The special signing phase of our operations has been devoted to the development of graphic signing as an aid to the motorists. In addition, by incorporating the Standard graphic signs of the Federal Manual on Uniform Traffic Control Devices, this unit has also assisted in the development of graphic signing to major generators that have qualified for Activity Signs under our current Sign Policy.

Because of the high influx of requests for Activity Signs and Services Signs, the Sign Processing Sub-Unit has processed many more Sign Orders than the previous year. Traffic Control for Construction and Maintenance Operations has been formulated under Section 850 of Department Standards.

Special signing in the past year involved:

- a. Transitional phase signing of the Central Artery in and out of the new Route 93 tie-in.
- b. "Wrong Way - Bus" signing was a significant part of this much publicized experiment.

Sign processing in 1972-73 saw (a) the implementation of new graphic signing introduced by the MUTCD. (b) A project of major dimensions was undertaken in the funding of a Statewide TOPICS sign program for the cities and towns of the Commonwealth under Department direction.

Another step forward has been the preliminary work-up of a comprehensive coded sign inventory system for engineering and maintenance computerization. Progress has also been made in the preliminary work on computerization of sign face shop drawings.

At various stages of study and evaluation are such traffic control components as: The Fitch Inertial Barrier - Breakaway Sign Posts and removal of signs from the median, the Hy-Dro Cell - and the expanded use of the Wrong Way Safety Signing.

III Pavement Markings

During the fiscal year the Pavement Marking Sub-Unit has reviewed the multitude of projects designed by others and have designed a variety of Department projects. The majority of these projects were designed according to the new national standard as set forth in the new Manual on Uniform Traffic Control Devices. This, of course, included the yellow pavement marking for two-way traffic and restrictive median strips. In keeping with the trend and where traffic volumes warranted their use, thermoplastic markings have been installed.

Among the significant developments have been the gradual trend toward the phasing out of the 3 lane pavement marking design in favor of the 2 lane design and the conversion of the 4 inch white solid line at the median of divided highway to a 6 inch solid yellow line.

IV Specifications and Standards

In conjunction with the preparation of Department projects either by consultants or in-house forces, this unit prepares and reviews standards and specifications for Traffic Signs and Supports and Pavement Markings. The basic specifications are contained in Section 825 of the Department's Standard Specifications.

Individual projects require special provisions to cover specifics which cannot be included in a general specification. They are written by this office on a project basis as the need arises.

Additionally the Unit was actively involved in the development of new and revised standards for sign and pavement markings on Construction and Maintenance Projects.

V Route Changes & Route Descriptions

A secondary function of this unit is to provide and maintain a complete and up-to-date record of Route Descriptions which include route length, description and location of termini, turns, major landmarks and overlaps with other routes.

New construction, relocations, reroutings are included in this constantly changing route system for the Department.

Route changes are also handled through this office. During the fiscal year the following is a list of the significant route changes:

Route Changes and Route Description

1. Rte. 62 relocated in Berlin - Clinton
2. Rte. 140 relocated - Taunton
3. Rte. 895 - deleted
4. Rte. 190 - approved
5. Rte. 140 - Gardner - Westminster returned to original location.
6. Rte. 49 - East Brookfield - Spencer extension.

Miscellaneous - Ready for distribution later this year should be an up-dated set of standard specifications. These will include supplementary specifications and many special provisions to reflect the improvement indicated by field studies in signing and pavement marking.

TRAFFIC SIGNAL, HIGHWAY LIGHTING AND SOPHISTICATED SYSTEMS UNIT

The authority and responsibility for the activities of this Unit are divided between three technical groups as follows:

- I. Traffic Signal Group
- II. Highway Lighting Group
- III. Sophisticated Systems Group

The iterative and special functions and activities performed by these groups during fiscal 1973 are as follows:

I. TRAFFIC SIGNAL GROUP

The Traffic Signal Group is responsible for the design of traffic signal systems, the review of traffic signal designs and the incorporation of new technologies into traffic signal system designs.

The group performed the following work and service during the past year:

- A. Processing of 167 Traffic Control Signal Permits
for Cities and Towns
- B. Review of 104 Areawide Topics Projects - 98 of
these projects, involving traffic signalization,
have been reviewed at the 25%, 75% and 100% level.

The 1973 Standard Specifications for Highways, Bridges and Waterways, Section 800, which covers traffic control signals and highway lighting was completely revised.

As time passes, the importance of the technologies involved in these areas will become a major factor in the highway plant. No longer will they occupy subordinate roles but will indeed control to a large degree the ultimate value of the facility.

TRAFFIC SIGNAL, HIGHWAY LIGHTING AND SOPHISTICATED SYSTEMS (cont'd)

Traffic signal equipment used by the Department is passed upon by the group. Solid state traffic controllers from two manufacturers; induction loop detectors from one manufacturer and signal heads from two manufacturers were evaluated and approved.

The Mass. Ave. TOPICS project will employ a very sophisticated study plan to ascertain its functionality prior to construction and its functionality after the project is completed.

The objectives of this study plan are to evaluate the effectiveness of improvements of the Massachusetts Avenue TOPICS Project No. 51 and to evaluate the effectiveness of different traffic control strategies by the use of existing computer simulation techniques prior to implementation. Traffic flow parameter data (e.g. accidents, accident rates, capacity, travel time and travel speed) will be supplied by the Massachusetts Department of Public Works' consultant, EAMS (TIPPETTS-ABBETT-McCARTHY-STRATTON) "before" and "after" implementation of the control aspects of the Massachusetts Avenue computerized traffic control system to accomplish the evaluation. The effectiveness of the Massachusetts Avenue Traffic Control System improvements through the use of benefit-cost analysis as required by FHWA PPA 21-18 will be evaluated.

Computer simulation in the place of "live" experimentation will be used to study the effectiveness of the control strategies that have already been designed. This will be done through an appropriate validation and data inputting of a computer program known as SCOT (Simulation of Corridor Traffic) that has been developed by TSC for the Federal Highway Administration (FHWA) Traffic Systems Division.

TRAFFIC SIGNAL, HIGHWAY LIGHTING AND SOPHISTICATED SYSTEMS (cont'd)II. HIGHWAY LIGHTING GROUP

During the past fiscal year, this group has reviewed numerous major highway lighting projects submitted by the Department's design engineers. Some of the more important projects in this category are: Route 128 from Lexington to Reading, I-86 in Sturbridge, Route 79 in Fall River, Route 18 in New Bedford and a rest area on I-93 in Wilmington.

This group has also continued the processing of existing contracts furnishing design engineering services for installation of highway lighting on Interstate Route 290 from Auburn to Worcester and I-95 from Chelsea to Revere. A new design contract has been initiated for the re-lighting of a portion of the Central Artery in Boston.

In addition to the above, the following projects have been developed and designed by this group: highway lighting on Route 2 in Arlington and Cambridge, the Whittier Bridge in Amesbury and Newburyport, the Quinn-Holmes Bridge and approaches in Lowell, Route 9 in Framingham, rest area lighting on I-95 in Mansfield and illuminated signs on Route 57 in Tolland.

This group is also responsible for reviewing shop drawings of lighting and electrical equipment, materials and appurtenances submitted by the Department's contractors for installation on projects that are now under construction (i.e. I-91 Longmeadow - Springfield, I-91 Holyoke).

The Highway Lighting Group develops and implements policies and warrants for highway lighting and illuminated signs. The Group also continuously reviews and revises the highway lighting section of the Department's Standard Specifications in order to incorporate the latest in lighting technologies into all Department projects.

TRAFFIC SIGNAL, HIGHWAY LIGHTING AND SOPHISTICATED SYSTEMS (cont'd)

For example, upon completion of several current construction projects, the Commonwealth should be a leader in the highway lighting field in the use of both high mast lighting and high pressure sodium light sources.

This Group also reviews highway lighting research conducted by other agencies and initiates, supervises and evaluates highway lighting research for the Department.

III. SOPHISTICATED SYSTEMS GROUPA. The "I-93 Corridor Traffic Operations Study"

The "I-93 Corridor Traffic Operations Study" was completed in May 20, 1973. The Design Engineer for the study was Wilbur Smith and Associates. This study identified the operating problems anticipated before the opening of Interstate Route 93, Somerville - Boston; established underlying planning objectives and suggested traffic management plans designed to improve its operation. The management strategy that was developed represented an extended application of traffic engineering principles to an urban expressway. This strategy served to guide opening of the road in February of 1973 to partial use of the southbound roadway from Medford to Somerville and full use of the northbound roadway from Boston to Medford except for a few peak PM restricted hours each day. The strategy also guided the opening of the completed southbound roadway in June of 1973 except for three AM closed hours.

TRAFFIC SIGNAL, HIGHWAY LIGHTING AND SOPHISTICATED SYSTEMS (cont'd)B. The Metropolitan Boston Surveillance and Control Project

Because of the poor operational characteristics that were forecast in the "I-93 Corridor Traffic Operations Study" for the I-695 and I-95 Interchange, the Department decided, in February of 1973, to limit the development of this system to the "surveillance" sub-system aspect only (i.e. obtaining traffic flow historical data for the purpose of qualitative and quantitative analysis). In addition, it was also decided to extend the "surveillance" aspect of this stage to include portions of the Central Artery, north to the Tobin Bridge. From this analysis of surveillance data for the first year of operation we hope to derive the necessary control strategies, tactics and regression models that are the "best fit" for any particular operational problem we may encounter when the "control" aspect sub-system is applied (i.e. the act of regulating traffic by mechanical and/or electrical means). We expect to advertise for bids for this project (i.e. the surveillance aspects) in January of 1974.

C. The Closed Circuit Television Sub-System - I-93 and I-95 -
Somerville - Boston

The plan and specifications for the Closed Circuit Television Sub-System of the Surveillance and Control System were completed in May of 1973. This sub-system has 38 camera locations between the following limits:

Along I-93, I-695 and I-95 beginning at a point on I-93 at approximately the Route 28 Intersection in Somerville, southerly to the north portal of the Dewey Square Tunnel in Boston and including that portion of I-95 to the

TRAFFIC SIGNAL, HIGHWAY LIGHTING AND SOPHISTICATED SYSTEMS (cont'd)

vicinity of the Tobin Memorial Bridge in Charlestown.

The control center for this sub-system is to be housed in rented space in the office building located at 150 Causeway Street in Boston. This space is located on the 11th floor and contains approximately 4800 square feet.

The Department advertised for bids for this sub-system on June 23, 1973 with the bids scheduled to be opened on August 21, 1973. The proposed work consists of installing and maintaining the sub-system within the limits previously specified.

D. Motorist Aid Communication Systems

The Department's efforts in the field of motorists' communications have expanded in fiscal year 1973, not only in the area of implementation but also in the area of planning for the future.

Based upon the knowledge we have gained from our ten mile evaluation installation on Route 495 in the Towns of Littleton, Westford and Chelmsford, we have now implemented a contract for the expansion of this evaluation system from Route I-95 in Salisbury to a point two miles south of the Mass. Pike (Route I-90). ADT Security Systems Company, low bidder, is currently making this expanded system installation.

In conjunction with this system installation, we are installing an experimental fog detection system on Route 93 between Reading and Andover. The fog detection unit is to be placed at the approximate center of a localized "fog lens" on Route I-93 that is peculiar to the southbound lane.

The fog detection unit will activate a fog warning sign approximately two miles from the center of the fog area to warn motorists of limited sight distance - and hazard ahead.

TRAFFIC SIGNAL, HIGHWAY LIGHTING AND SOPHISTICATED SYSTEMS (cont'd)

There will be modifications to this system from time to time to improve its service function.

During the past year the General Court voted funds under Chapter 765, Section 2A, to expand our Motorist Aid Systems to other primary highways within the State. The sum of \$2,000,000. was voted for the four regions of the State. It was decided that Interstate Route I-91 from the Vermont border to the Connecticut border and Interstate Route I-195 from Seekonk to New Bedford would be chosen as sites for the new installations.

As our systems expand and technologies change, we find that there is an increasing need for cooperation, relative to the environment, with other governmental agencies within the Commonwealth. Due to the fact that there is a need to be concerned with areas outside the highway plant, we have opened up new vistas of cooperation and agreement with other Departments and Agencies upon whom we have come to depend for the success of our Motorist Aid Call Box Systems.

STATE AID SECTION

The State Aid Section has the responsibility of processing the payment of State Funds to the Cities and Towns in the Commonwealth for the improvement and maintenance of local roads.

Chapter 90

Generally, the State pays one-half the cost of construction and improvement projects with the County and the Municipality each contributing one-fourth. Maintenance Assignments are usually divided equally with the State, County and Municipality, each contributing an equal share of one-third. The Chapter 90 Fiscal 1973 Tentative Assignments total \$16,767,780.00 with the State's Share amounting to \$7,967,440.00.

Changes in policy of administering Chapter 90 were adopted at the March 28, 1973 Commissioners Meeting. These policy changes have no effect on this 1973 Fiscal Year Report.

1. Declare all existing Department policies concerning the Chapter 81 and Chapter 90 programs to be terminated, with the proviso that the State Aid Engineer is to bring all existing Chapters 81 and 90 commitments to a satisfactory conclusion.
2. Declare that whenever funds are appropriated or otherwise made available for projects for the construction and maintenance of town and county ways as provided in subdivision (2) (a) of section thirty-four of Chapter Ninety of the General Laws, the words "town and county ways" shall mean all public highways other than state highways, as determined by the most recent survey conducted by the Department.

3. Declare the funds made available to the cities and towns, as outlined in the preceding paragraph, shall be available for preliminary engineering, right of way, construction and maintenance under the direction of the Department.
4. Declare that construction as used in the preceding paragraph shall be defined as "the construction or considerable reconstruction of any public highway right-of-way, including resurfacing and other work incidental to the above such as shoulders, side road approaches, landscaping and tree planting, roadside drainage, structures including bridges, sidewalks, traffic control and service facilities, street lighting, exclusive of power costs, unusual or disaster operations and for such other purposes as the Department may specifically authorize.
5. Declare that the formula for the disbursement of funds made available under subdivision (2) (a) of section thirty-four of Chapter Ninety of the General Laws be as follows:
 - (a) Fifty per centum in the proportion to which the number of miles of public way, other than state highway in each city or town bears to the total number of miles of public ways, other than state highways, in all such cities and towns in the Commonwealth;
 - (b) Twenty-five per centum in the proportion to which the population of each city or town bears to the total population of all such cities and towns in the Commonwealth;

STATE AID SECTION

(c) Twenty-five per centum in the proportion to which the number of persons whose place of employment is located in each city or town bears to the total number of persons whose place of employment is located within the Commonwealth.

6. Declare that the funds made available under Section 4 of Chapter 765 of the Acts of 1972, current and as proposed to be amended, be distributed in accordance with the formula established under item 5 as follows:

(a) \$10,750,000.00 annually on a statewide basis.

(b) \$30,000,000.00 annually to the communities outside the MBTA.

(c) Balance of appropriated funds is to be used as necessary to adjust the distribution to assure that no community receives less than its FY 1973 formula allocation under the Chapter 81 and Chapter 90 programs and that no city or town outside the MBTA district receives less than twice its FY 1973 formula allocation.

7. Declare that the state's share of locally aided highway projects be increased from 50% to 75%, except as noted below where the state's share will be 100%.

The Department will periodically identify a system of local roads that it finds to be essential for through as well as local travel purposes, and will promulgate design standards that it deems desirable for such roads. The network of roads so designated will be known as the Chapter 90 Primary System.

In order to be eligible for state assistance, major capital improvements on the Chapter 90 Primary System will have to meet Department Standards. The local share of such projects will be waived, making that state share 100 percent. Lesser improvements on the Chapter 90 Primary System, such as resurfacing, will be handled in the

STATE AID SECTION

same manner as Chapter 90 projects off the Primary System.

Whenever an improvement on a Chapter 90 Primary Road involves or affects more than one community each community involved must agree to bring the highway up to specified standards prior to any one community receiving waiver of its local share.

8. Declare that the Department will henceforth assume the "party of the first part" in all Chapter 90 contracts unless a locality specifically requests otherwise. The local share of the costs shall be covered by contributions from municipalities or other sources.

This section is not intended to preclude any community from performing work on a force account basis.

STATE AID SECTION

TENTATIVE 1972 CHAPTER 90 ASSIGNMENTS

SUMMARY

COUNTY	STATE	CITY/TOWN	COUNTY	TOTAL
BARNSTABLE	\$261,400	\$138,950	\$138,950	\$ 539,300
BERKSHIRE	494,400	306,725	307,475	1,108,600
BRISTOL	611,800	330,050	330,050	1,271,900
DUKES	44,000	25,800	25,800	95,600
ESSEX	730,500	377,550	361,150	1,469,200
FRANKLIN	366,500	228,500	228,500	823,500
HAMPDEN	629,750	354,650	354,650	1,339,050
HAMPSHIRE	333,600	197,825	197,825	729,250
MIDDLESEX	1,472,250	772,900	780,300	3,025,450
NANTUCKET	28,990	28,990	-	57,980
NORFOLK	633,100	349,650	349,650	1,332,400
PLYMOUTH	530,200	280,600	280,600	1,091,400
SUFFOLK	618,100	618,100	-	1,236,200
WORCESTER	1,212,850	717,550	717,550	2,647,950
	\$7,967,440	\$4,711,440	\$4,072,500	\$16,767,780

CHAPTER 81-SECTIONS 26-29-GENERAL LAWS AS AMENDED

(PROVIDED LEGISLATURE APPROPRIATES SAID SUM FOR 1973)

TOWNS UNDER \$5,000,000 VALUATION - LESS THAN 12.00 ROAD MILEAGE RATIO

VALUATION FROM CHAPTER 559-ACTS OF 1945

COUNTY	TOWNS	MILES	-1.40	-2.00	-2.80	-3.50	-5.50	-7.00	-9.00	-12.00
			\$15.00	\$25.00	\$40.00	\$50.00	\$75.00	\$100.00	\$125.00	\$150.00
BARNSTABLE	7	459.41	0	0	0	0	2	4	1	0
BERKSHIRE	23	569.33	4	2	5	6	4	2	0	1
BRISTOL	3	505.75	0	0	0	0	3	2	0	1
DUNES	3	56.27	0	0	0	0	0	0	0	0
ESSEX	10	418.56	0	0	0	0	1	0	2	0
FRANKLIN	25	1171.76	6	1	3	3	4	1	3	2
HARPOEN	12	674.24	1	2	3	1	3	2	0	0
HAMPSHIRE	15	758.87	3	2	3	2	3	0	1	1
MIDDLESEX	24	1558.55	0	1	1	1	5	3	9	4
NORFOLK	6	313.63	0	0	0	0	0	1	2	2
PLYMOUTH	8	527.15	0	0	0	0	3	3	1	1
Worcester	44	282.51	1	4	1	3	14	8	8	5
TOTALS	183	10032.52	15	12	16	16	43	28	31	22

TOWNS	ROAD MILEAGE RATIO	MILES	RATE PER MILE	TOWN PAYS	STATE PAYS
15	-1.40	734.27	15.00	11006.	201916.
12	-2.00	548.61	25.00	13768.	150860.
16	-2.80	862.81	40.00	34505.	237264.
10	-2.50	911.71	50.00	45574.	250711.
43	-5.50	2411.60	75.00	180845.	663165.
28	-7.00	1761.06	100.00	176079.	467780.
31	-9.00	1812.08	125.00	226489.	498301.
22	-12.00	1056.44	150.00	157550.	288859.
103		10032.52		839756.	2759856.

TOWN NAME	MILES	PROPOR- TION		RC&E		TOWN		STATE		TOTAL	STATE PER- CENT- AGE	MAX. AMT. FOR SNOW REMOVAL AND SAND- ING INC. IN TOTAL
		STATE TAX PER MILLION	TOWN TAX PER MILLION	FILE- AGE	RATIO	RATE PER MILE	PAYS	PAYS				
BREWSTER	41.68	340.	5199.	3.17	125.	11439.	16638.	68.75	3119.			
DENNIS	115.23	710.	11522.	9.16	100.	31658.	43210.	73.33	8642.			
CASHMAN	44.44	230.	3332.	5.18	75.	12220.	15552.	78.58	3332.			
BASHPEE	40.00	150.	3000.	3.75	75.	11000.	14000.	78.57	3000.			
SANDWICH	79.42	460.	7941.	5.73	100.	21840.	29781.	73.34	5956.			
TRURO	38.84	200.	3883.	6.69	100.	10680.	14563.	73.34	2912.			
WELLFLEET	45.68	340.	4987.	6.82	100.	13716.	18703.	73.34	3748.			
TOTALS	405.41		39864.			112583.	152447.		30701.			

TOWN NAME	MILES	PROPOR- TION STATE TAX PER MILLION	ROAD MILE- AGE	TOWN RATE PER MILE	TOWN PAYS	STATE PAYS	TOTAL	STATE CENT- AGE	MAX. AMT. FOR SNGH REMOVAL AND SAND- ING INC.	
									IN TOTAL	
ALFORD	17.82	50.	2.81	50.	890.	4900.	5790.	84.63	1336.	
BUCKET	50.73	140.	2.26	40.	2349.	16159.	18499.	87.30	4404.	
CHESHIRE	41.75	200.	4.79	75.	3131.	11481.	14612.	78.57	3131.	
CLARKSBURG	14.44	140.	9.97	150.	2105.	3839.	5965.	64.71	1052.	
CLAREMONT	34.77	160.	4.60	75.	2607.	9561.	12168.	78.57	2607.	
FLORIDA	40.30	230.	5.71	100.	4029.	11382.	15411.	73.34	3022.	
HARDUCK	25.23	80.	3.17	50.	1261.	6938.	8199.	84.62	1892.	
HINSCALE	35.86	150.	4.18	75.	2689.	9861.	12550.	78.57	2689.	
LANESBOROUGH	43.32	250.	5.31	75.	3248.	11912.	15160.	78.58	3248.	
NEWTOWN	47.97	140.	2.92	50.	2353.	13191.	15544.	84.62	3597.	
ST. ANDREW	17.35	30.	1.73	25.	433.	4771.	5204.	91.68	1301.	
WEST BARNSTAPLE	3.37	20.	2.63	40.	354.	2714.	3168.	97.32	740.	
WEST BARNSTAPLE	55.38	230.	3.69	40.	3415.	23479.	26894.	87.30	6403.	
WEST BARNSTAPLE	41.75	110.	2.51	40.	1751.	12031.	13781.	87.30	3281.	
WEST BARNSTAPLE	36.23	50.	1.44	25.	861.	9731.	10592.	91.67	2645.	
WEST BARNSTAPLE	35.25	120.	3.14	50.	1912.	10518.	12430.	84.62	2868.	
WEST BARNSTAPLE	31.70	110.	1.35	15.	1225.	22437.	23662.	94.83	6127.	
WEST BARNSTAPLE	45.83	40.	0.82	15.	735.	13463.	14218.	94.83	3677.	
WEST BARNSTAPLE	50.75	270.	3.54	50.	4037.	22230.	26267.	84.62	6056.	
WEST BARNSTAPLE	25.67	80.	3.12	50.	1283.	7059.	8342.	84.62	1925.	
WEST BARNSTAPLE	44.61	300.	3.67	150.	672.	12322.	12994.	94.83	3360.	
WEST BARNSTAPLE	33.89	230.	6.97	100.	3298.	9172.	12470.	73.34	2474.	
WEST BARNSTAPLE	64.71	80.	1.24	150.	970.	17795.	18765.	94.83	4853.	
TOTALS	969.53				45712.	265554.	312266.		72688.	

BRISTOL COUNTY

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TOWN NAME	MILES	PROPORTION		ROAD MILE- AGE	TOWN RATE PER MILE	TOWN PAYS	STATE PAYS	TOTAL	STATE PER- CENT- AGE	MAX. AMT. FOR SNOW REMOVAL AND SAND- ING INC.	
		STATE TAX PER MILLION	TOWN TAX PER MILLION							IN TOTAL	IN TOTAL
ACUSHNET	45.15	540.		11.96	150.	6772.	12416.	19183.	64.71	3386.	3386.
BERKLEY	42.41	150.		3.54	75.	3180.	11662.	14842.	78.57	3180.	3180.
DIGHTON	52.98	55.		15.38	150.	7946.	14569.	22515.	64.71	3973.	3973.
FREETOWN	51.82	250.		4.82	75.	3886.	14250.	18136.	78.57	3886.	3886.
MORTON	60.59	350.		5.86	100.	6658.	18312.	24970.	73.34	4994.	4994.
RAYNHAM	52.15	310.		5.94	100.	5214.	14341.	19555.	73.34	3911.	3911.
REHOBOTH	116.50	460.		3.95	75.	3737.	32037.	43774.	78.57	8737.	8737.
SAVANSEA	82.15	720.		8.76	125.	10268.	22591.	32859.	68.75	6161.	6161.
TOTALS	505.75					52661.	140178.	192839.		38228.	38228.

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DUKES COUNTY

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TOWN NAME	MILES	PROPORTION	ROAD MILE-AGE	TOWN RATE PER MILE	TOWN PAYS	STATE PAYS	TOTAL	STATE PER-CENTAGE	MAX. AMT. FOR SNACK REMOVAL AND SAND-ING INC. IN TOTAL
CHILMARK	14.46	120.	8.33	125.	1807.	3976.	5783.	68.75	1024.
GAY HEAD	7.99	30.	3.75	75.	599.	2197.	2796.	78.58	599.
WEST TISBURY	13.02	120.	6.60	125.	1727.	3800.	5527.	68.75	1036.
TOTALS	35.47				4133.	5973.	14106.		2719.

TOWN NAME	PILES	PROPOR-		ROAD	TOWN	STATE	TOTAL	STATE	MAX. AMT.
		TICK	STAT	MILE-	RATE	PAYS		PER-	
		MILLION	TAX PER	AGE	PER			AGE	FOR SNOW
				RATIO	MILE				REMOVAL
									AND SAND-
									ING INC.
									IN TOTAL
ESSEX	73.25	190.		2.59	40.	2935.	20146.	87.30	5494.
GEORGETOWN	26.29	28.		5.83	150.	3958.	7257.	64.71	1979.
GROVELAND	41.91	31.		7.47	125.	5235.	11525.	68.75	3143.
MERRIMACK	35.59	29.		5.83	100.	3658.	10062.	73.34	2744.
MIDDLETON	33.19	31.		5.34	150.	4978.	9127.	64.71	2489.
NEWBURY	33.89	25.		10.33	150.	5023.	9319.	64.71	2541.
ROSELLEY	47.77	37.		7.75	125.	5971.	13136.	68.75	3582.
TOPSFIELD	34.32	28.		7.53	125.	4287.	9432.	68.75	2572.
WEST NEWBURY	49.75	40.		9.23	150.	7462.	13631.	64.71	3731.
	41.01	23.		5.61	100.	4103.	11277.	73.34	3075.
TOTALS	415.50					47665.	114962.		31350.
							162027.		

PROPERTY - 1977

FRANKLIN COUNTY

TOWN NAME	MILES	PROPORTION		ROAD MILE-AGE	TOWN RATE PER FILE	TOWN TAX		STATE TAX	TOTAL	STATE PER-AGE	MAX. AMT. FOR SNOW REMOVAL AND SANDING INC. IN TOTAL	
		TAX PER MILLION	STATE TAX			PAYS	PAYS					
ASHFIELD	75.46	22.0	2.92	50.	3772.	2,751.	24523.	54.62	5659.			
DEWARLTON	42.10	160.	3.80	75.	3157.	11577.	14734.	78.57	3157.			
DOCKLAND	46.44	46.	9.99	151.	685.	12660.	19565.	64.71	3452.			
CHARLEMMONT	46.33	150.	3.24	50.	2316.	12742.	15956.	84.62	3474.			
COLUMBIA	85.52	25.	2.92	50.	4278.	23534.	27612.	84.62	6418.			
GRAND	72.12	15.	2.5	41.	2524.	23167.	23031.	87.30	5482.			
DEERFIELD	80.54	67.	6.32	125.	1107.	22143.	32215.	68.75	5040.			
WILLIAMSBURY	34.20	160.	4.69	72.	2564.	9444.	11963.	78.58	2564.			
WINDHAM	42.90	41.	3.82	15.	733.	13447.	14100.	94.83	3667.			
LEWIS	34.17	70.	1.29	15.	811.	14869.	15630.	94.83	4055.			
LEWIS	31.76	6.	2.37	40.	1350.	9293.	10335.	87.30	2531.			
LEWIS	33.31	5.	1.27	15.	592.	10862.	11454.	94.83	2562.			
LEWIS	17.92	160.	8.93	125.	2239.	4927.	7166.	68.76	1345.			
LEWIS	28.44	50.	1.20	15.	576.	10570.	11146.	94.83	2882.			
LEWIS	56.41	31.	4.97	75.	4960.	18262.	23242.	78.57	4980.			
LEWIS	92.64	72.	8.71	125.	10329.	22725.	33254.	68.75	6197.			
LEWIS	99.99	11.	2.75	40.	1599.	10997.	12596.	87.31	2999.			
SHUTTLAND	51.27	54.	10.53	150.	769.	14999.	21769.	64.71	3945.			
SHUTTLAND	56.05	61.	1.68	25.	501.	9513.	10814.	51.57	2703.			
SHUTTLAND	36.51	23.	6.30	100.	365.	10049.	13660.	73.34	2738.			
SHUTTLAND	50.12	60.	1.19	15.	825.	15133.	15958.	94.83	4127.			
SHUTTLAND	47.29	50.	1.06	15.	709.	13034.	13713.	94.83	3546.			
SHUTTLAND	40.61	21.	5.17.	75.	3045.	11167.	14212.	78.57	3045.			
TOTALS	1171.76				76312.	322219.	398251.		87867.			

TOWN NAME	MILES	PROPER- TY TAX			ROAD FILE- AGE	TOWN RATE PER MILE	TOWN PAYS	STATE PAYS	TOTAL	STATE PER- CENT- AGE	MAX. AMT. FOR SACK REMOVAL AND SAND- ING INC. IN TOTAL
		TOWN	STATE	TAX PER MILLION							
GLANFORD	68.83	140.			2.05	40.	2873.	18378.	21051.	87.30	5012.
BRIMFIELD	63.57	170.			2.67	40.	2542.	17481.	20023.	87.30	4767.
CHESTER	58.25	21.			3.61	75.	4368.	16.18.	20306.	78.57	4368.
GRAVILL	71.31	22.			4.54	75.	5288.	19390.	24678.	78.57	5288.
HAMPODEN	45.29	150.			3.31	50.	2264.	12454.	14718.	84.62	3356.
HOLLAND	33.92	40.			1.18	15.	508.	9327.	9835.	54.83	2543.
MONTGOMERY	16.03	560.			5.28	75.	7952.	29153.	37115.	78.57	7952.
SOUTHWICK	23.99	5.			1.72	25.	724.	7972.	6656.	91.67	2174.
TOLLAND	58.39	37.			6.34	10.	5336.	16157.	21895.	73.34	4379.
WALTON	40.89	70.			1.71	25.	1022.	11244.	12266.	91.67	3066.
WILKINSON	24.31	60.			2.47	40.	972.	6685.	7657.	87.31	1823.
WILKINSON	77.26	53.			6.86	100.	7725.	21246.	28971.	73.34	5794.
TOTALS	674.24						41976.	185410.	227286.		50362.

TOWN NAME	MILES	PROPORTION			ROAD MILE- AGE	TOWN RATE PER MILE	TOWN PAYS	STATE PAYS	TOTAL	STATE PER- CENT- AGE	TAX-ART. FOR SACK REMOVAL AND SAND- ING INC. IN TOTAL
		STATE TAX PER MILLION	STATE TAX PER MILLION	STATE TAX PER MILLION							
BULCHENTON	104.76	28.	28.	28.	2.67	4.	419.	2888.	32598.	87.30	7256.
CHESTERFIELD	51.55	1.	1.	1.	1.73	25.	1444.	15394.	17330.	91.67	4334.
CUMMINGTON	52.55	9.	9.	9.	1.72	25.	1300.	14396.	15724.	91.67	3926.
GRAND	23.15	6.	6.	6.	2.21	45.	1067.	7477.	8564.	87.31	2039.
GRAND	55.41	16.	16.	16.	2.50	50.	2700.	13182.	17942.	84.62	4140.
GRAND	63.01	41.	41.	41.	7.40	125.	7375.	17327.	25233.	64.75	4725.
HAFFIELD	50.53	47.	47.	47.	5.34	15.	7545.	15843.	21387.	64.71	3774.
HUNTINGTON	34.03	17.	17.	17.	5.00	75.	2552.	9353.	11911.	78.57	2552.
WILLOWFIELD	38.46	5.	5.	5.	1.50	15.	578.	1576.	11152.	54.84	2684.
WILLOW	26.12	11.	11.	11.	5.47	75.	1578.	5532.	7110.	73.58	1508.
WILLOWFIELD	49.21	5.	5.	5.	1.11	15.	739.	13561.	14299.	94.33	3659.
WILLOWFIELD	58.13	13.	13.	13.	3.11	55.	2906.	15985.	18891.	84.62	4359.
WESTHAMPTON	45.4	5.	5.	5.	1.32	15.	680.	12464.	13164.	54.83	3404.
WILLIAMSBURG	43.15	23.	23.	23.	5.33	75.	2233.	11857.	15190.	78.58	3233.
WILLOWFIELD	53.05	12.	12.	12.	2.01	40.	2305.	16433.	18788.	87.31	4473.
TOTALS	753.57						45793.	238679.	249472.		56505.

TOWN NAME	MILES	PROPR- TICN		ROAD- MILE- AGE	TOWN PER MILE	STATE PAYS	TOTAL	STATE CENT- AGE	MAX. AMT. FOR SACK REMOVAL AND SAND- ING INC. IN TOTAL
		STATE TAX PER MILLION	TOWN PAYS						
ACTON	85.69	65.	10711.	7.59	125.	23564.	34275.	68.75	6426.
ASHBY	55.72	20.	295.	3.39	5.	15231.	1913.	84.62	4426.
ASHLAND	50.47	47.	757.	9.31	150.	15879.	21449.	64.71	3765.
DESFORD	62.35	46.	7793.	7.38	125.	17146.	24939.	68.75	4676.
DOVERBOROUGH	23.11	6.	924.	2.60	4.	6355.	7279.	87.21	1733.
DORLINGHAM	75.94	38.	5695.	5.00	75.	2883.	26578.	78.57	5695.
CARLISLE	45.73	10.	3733.	3.62	75.	13689.	17422.	78.57	3733.
ORACUT	15.23	72.	1522.	6.84	125.	20738.	39400.	73.34	7892.
QUINSTABLE	26.74	7.	918.	1.91	25.	10103.	11021.	91.57	2755.
SEELMA	75.94	72.	11952.	9.21	15.	21983.	33973.	64.71	5995.
FELTSTON	60.12	51.	6514.	8.93	125.	18732.	27246.	68.75	5108.
HARKINSON	7.21	54.	3775.	7.69	125.	19317.	25283.	64.75	5265.
LITTLETON	52.64	47.	6375.	6.83	125.	14473.	21734.	62.75	3947.
LOUTH FACING	48.81	44.	7318.	9.2	15.	13413.	21734.	64.71	3559.
PROPERWELL	71.55	48.	7154.	8.74	125.	19670.	2683.	73.34	5366.
SPERDUNA	48.81	5.	721.	13.58	150.	12372.	19593.	64.71	3510.
SHIMLEY	48.73	37.	5841.	7.92	125.	1435.	18691.	63.75	3534.
STON	44.92	22.	2143.	5.25	75.	11527.	1437.	78.58	3143.
SUDBURY	92.80	61.	9289.	6.83	125.	25311.	34511.	73.33	6901.
THORNTON	12.53	72.	12653.	7.14	125.	27728.	42311.	68.75	7562.
THORNTON	71.55	39.	5288.	5.45	75.	15676.	25042.	73.57	5366.
THORNTON	48.77	23.	3605.	4.73	75.	13219.	16324.	78.57	3605.
WESTFORD	68.53	68.	11151.	7.71	125.	24621.	35811.	68.75	6714.
WILMINGTON	81.25	67.	13194.	8.21	125.	22428.	32622.	68.75	6116.
TOTALS	1556.59		169312.			428599.	597311.		118381.

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ACRFGK COUNTY

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TOWN NAME	MILES	PROPOR- TION		ROAD		TOWN		STATE		TOTAL		STATE PER- CENT- AGE	MAX. AMT. FOR SNOW REMOVAL AND SAND- ING INC.		IN TOTAL
		TAX	PER MILLION	MILE- AGE	RATIL MILE	PAYS	PAYS	PAYS	PAYS	TOTAL	TOTAL				
JELLINGHAM	74.07	44.		5.94	100.	7406.	22359.			27775.	73.34				5555.
MEDFIELD	55.76	48.		6.61	125.	6969.	15333.			22362.	68.75				4181.
MEDWAY	55.06	53.		10.59	150.	7508.	13766.			21274.	64.71				3754.
MILLIS	44.99	52.		11.21	150.	6688.	12262.			18950.	64.71				3344.
PLAINVILLE	47.76	24.		5.23	75.	3581.	13133.			16714.	78.57				3581.
TOTALS	302.60	282.		7.70	125.	4544.	9993.			14542.	68.75				2726.
TOTALS	302.60					36690.	84861.			121557.					23141.

TOWN NAME	MILES	PROPR- TILN		ROAD		TOWN		STATE PAYS	TOTAL	STATE PER- CENT- AGE	MAX. AMT. FOR SNOW REMOVAL AND SAND- ING INC. IN TOTAL
		TAX PER MILLION	AGE	FILE- RATIO	RATE PER MILE	PAYS					
CARVER	66.71.	450.	6.75	100.	100.	6670.	18345.	25315.	73.34	5003.	
HALIFAX	41.82	240.	5.74	100.	100.	4181.	11599.	15681.	73.34	3136.	
HARSON	42.26	440.	10.17	100.	100.	6488.	11890.	18384.	64.71	3244.	
LAKEVILLE	48.87	260.	5.32	75.	75.	3665.	13439.	17104.	78.57	3665.	
NEWELL	57.13	380.	6.85	100.	100.	5712.	15710.	21422.	73.34	4284.	
PLYMOUTH	57.20	500.	8.74	125.	125.	7149.	15729.	22878.	68.75	4289.	
PLYMPTON	31.19	130.	4.17	75.	75.	2339.	8577.	10916.	78.57	2339.	
ROCHESTER	51.01	240.	4.7	75.	75.	3825.	14027.	17852.	78.57	3925.	
TOTALS	397.19					48029.	109223.	149252.		29785.	

TOWN NAME	MILES	PROPR- TICK		ROAD MILE- AGE	TOWN RATE PER MILE	TOWN PAYS	STATE PAYS	TOTAL	STATE PER- CENT- AGE	MAX. AMT. FOR SNOW REMOVAL AND SAND- ING INC.	
		TAX	STATE							IN TOTAL	IN TOTAL
ASHBURNHAM	78.70	290.		3.68	75.	5902.	21642.	27544.	73.57	5902.	
BARRE	55.55	50.		5.00	75.	7496.	27488.	34982.	78.57	7496.	
BEELIN	41.41	20.		4.85	75.	3135.	11387.	14492.	78.57	3135.	
BLACKSTONE	25.24	40.		10.46	15.	5753.	1515.	16252.	64.71	2867.	
BOLTON	54.98	18.		3.21	50.	2748.	1044.	13060.	73.34	2736.	
BOYLSTON	37.33	16.		4.29	75.	2738.	10265.	13003.	78.57	2799.	
BROCKFIELD	36.51	22.		8.03	15.	5650.	10049.	13699.	73.34	2736.	
CHARLTON	107.86	33.		3.16	50.	5392.	29661.	35053.	94.62	8089.	
CHUDLEY	70.95	37.		5.21	75.	5321.	19511.	24832.	78.57	5321.	
EAST BROCKFIELD	75.11	59.		7.86	125.	9383.	26655.	36038.	68.75	5633.	
FRANKLIN	15.60	17.		8.64	125.	2459.	5411.	7873.	68.75	1475.	
GRANTON	70.27	72.		5.44	150.	1144.	2974.	32414.	64.71	5720.	
HARDWICK	68.16	27.		3.06	50.	4457.	24243.	28650.	84.62	6611.	
HARVARD	62.13	38.		6.13	100.	6202.	17538.	23740.	73.34	4652.	
HILDEN	55.42	65.		6.50	100.	9541.	26243.	35784.	73.34	7156.	
HUBBARDSTON	73.06	23.		1.73	25.	1876.	26641.	22517.	91.67	5629.	
LEICESTER	55.95	40.		7.15	125.	6993.	15386.	22379.	68.75	4156.	
LONGMEADOW	78.18	57.		7.45	125.	9322.	23543.	30471.	68.75	5713.	
MANDUKE	37.18	39.		5.27	75.	5772.	21136.	26938.	78.57	5772.	
MILLVILLE	16.66	24.		6.46	100.	3717.	10224.	13941.	73.34	2788.	
NEW CRAINFORD	51.64	15.		8.84	125.	2119.	4833.	6782.	68.76	1271.	
NORTH BROCKFIELD	70.35	42.		1.94	25.	1291.	14200.	15490.	91.67	3872.	
NORTHSTOCKFORD	62.71	35.		5.97	100.	7334.	19246.	26380.	73.34	5276.	
OKHAM	43.89	8.		5.52	100.	6270.	17245.	23515.	73.34	4703.	
OXFORD	35.68	55.		1.82	25.	1597.	12069.	13166.	91.67	3291.	
PAXTON	34.39	19.		7.17	125.	9586.	21089.	30675.	68.75	5751.	
PETERSHAM	64.35	23.		5.52	100.	3458.	9457.	12895.	73.34	2579.	
PHILLIPSTON	43.71	60.		3.56	75.	4843.	17773.	22626.	78.57	4848.	
PRINCETON	75.53	20.		1.37	15.	655.	12317.	12672.	94.83	3277.	
ROYALSTON	71.57	20.		2.65	40.	3021.	20770.	23791.	87.50	5664.	
ROULAND	62.53	12.		1.65	25.	1814.	19956.	21770.	91.67	5442.	
SOUTHAMPTON	52.14	24.		3.84	75.	4689.	17195.	21884.	78.57	4689.	
SPENCER	97.87	55.		10.55	150.	7021.	14338.	22158.	64.71	3910.	
STERLING	76.95	35.		7.36	125.	12233.	26914.	39147.	68.75	7340.	
STONBRIDGE	75.28	37.		4.55	75.	5771.	21161.	26932.	78.57	5771.	
SUTTON	67.89	35.		4.91	75.	5645.	20701.	26346.	78.57	5645.	
TEMPLETON	65.54	30.		5.75	75.	6591.	24169.	30760.	78.57	5591.	
UPTON	61.51	24.		7.66	125.	8317.	18298.	26615.	68.75	4990.	
WARREN	62.83	40.		6.98	100.	4613.	16315.	21528.	78.57	4613.	
WEST BOYLSTON	45.65	30.		9.64	150.	6879.	18319.	25198.	73.34	5159.	
WEST BROCKFIELD	53.35	20.		4.31	75.	6347.	12553.	19400.	64.71	3423.	
WEST STONBRIDGE	71.10	72.		10.12	150.	4001.	14671.	18672.	78.57	4001.	
WESTMINSTER	63.61	50.		3.96	75.	10076.	19574.	30250.	64.71	5338.	
TOTALS	2820.51					245023.	775615.	1020618.		211513.	

RESEARCH & MATERIALS SECTION

MANUFACTURED PRODUCTS UNIT

PRESTRESSED BEAMS

During the fiscal year fourteen (14) bridge structures designed with prestressed beams were constructed. These structures included I-beams, Box-beams, and slab beams. It is interesting to note that one of the largest prestressed beam bridges in New England was constructed (Prison Point Bridge) between Charlestown and Cambridge.

All necessary inspection and tests were performed to insure a quality product. No beams or precast units were stamped or shipped until such time that all physical measurements were checked and recorded, or until all visible defects were remedied.

At the present time there are four (4) plants are engaged in the fabrication of prestressed beams in the State.

PRECAST UNITS

With Highway Safety in view a new concept of Median Barriers was developed featuring concrete units faced with granite. This particular type was installed on Charlestown-Rutherford Avenue project. This particular design should be inspected on a yearly basis, to determine condition as to spalling etc. If after five (5) yearly inspections the condition of units were satisfactory, it would determine the feasibility of continuing the use of the design.

Precast Electric Handholes were in considerable demand during this fiscal year.

CONCRETE PIPE

All necessary tests and inspections were performed and recorded as required. In many instances, special designed pipes were submitted to the Research and Materials Section and checked for design and approved and subject to final approval on the results of strength tests.

At the present time there is a demand for precast manholes and catch basins, and flared-end units. The same dilligent inspection was performed as on concrete pipe.

At the present time there are (7) seven pipe plants, (6) six in Massachusetts and one (1) in New Hampshire.

There are four (4) pipe plants in Connecticut that requested the privilege of bidding on projects in Massachusetts, but they are ineligible because their pipe joints of 12" through 24" diameters do not conform to our standards for full bell and spigot. However, the diameters of 30" and larger do conform to our requirements for tongue and groove.

METAL PIPE

All necessary tests and inspections, as required, were performed semi-annually on metal pipe.

There are three (3) fabricating plants located in Massachusetts and one (1) in Vermont.

MISCELLANEOUS

Inspection and tests were performed on Concrete posts, blocks, metal castings and other products pertinent to road building.

RESEARCH & MATERIALS SECTION

SPECIAL ASSIGNMENTS

In many instances the unit investigates contemplated changes in specifications of concrete and metal pipe as submitted by task force committees of AASHO and ASTM.

PERSONNEL

At the present time, the complement of of this unit consists of three men, If, in the future the program is accelerated to any extent, it would be necessary to increase the number of men to carry out the required inspection efficiently.

IN HOUSE RESEARCH

EXPERIMENTAL CHAIN LINK FENCING

This past year contracts let for fencing of I-95 from Dedham to the Massachusetts - Rhode Island State line were completed.

Two of the contracts incorporated new methods of installation and a third, our standing method, (concrete base) is being used as a control section.

One of the experimental projects has driven line posts, the other has driven line posts including 30" diagonally driven anchors just below ground elevation for added support.

To present both experimental sections are comparable to the control section.

DYNAPAC VIBRATORY COMPACTOR

The experimental use of the Dynapac vibratory compactor for compaction of Type I-1 top course has recently been investigated on the Mattapoissett - Fairhaven I-195 project.

A report is forthcoming upon completion of the roughometer results.

PRODUCT EVALUATION

The Product Evaluation Committee with its new membership has reviewed all products evaluated in the past and has compiled a list of all active and new products now under evaluation.

This list was submitted to the Operating Subcommittee on Materials, AASHO for compilation and distribution to all Members, in an effort to eliminate much duplication of testing and to

PRODUCT EVALUATION (CONT'D)

provide better service to the public.

Following is a list of accepted products tested and evaluated by the Committee:

DCA 70 from Union Carbide - Erosion Control

Astro-Turf from Monsanto - Artificial Turf

Duropipe from Sonoco Products Co. - Bituminized Fibre Pipe

FAS-CAL 900 from Fasson Co. - Decal Material

Five Star (premixed) from U. S. Grout Corp. - Concrete Patch

Gamma Velox Concrete Epoxy from Cadillac Paints - Concrete Epoxy
Coating

Koppers Organic Zinc from Koppers - Organic Coating

Modular Glare Barrier from Wheeling Corrugating Co. - Glare
Barrier

Osmose K-33 from Osmose - Wood Preservative

PRC 3105 from Products Research Co. - Jointsealer

Peliclene from Paliclene Ctg. & Chemical - Concrete Rust
Remover

Ritza (Anti-Glare) from Koch Division Schmidt Ind. - Glare
Barrier

#73-1 from Midland Division - Dexter Corp. - Steel Coating

Soil Retention Blanket from American Excelsior Corp. - Erosion
Control

Solite from Solite Corp. - Lightweight Aggregate

Temptite Pipe from Johns Manville - Low Temperature Pressure
Pipe

Tri-Kote from T-K Products Inc. - Concrete Curing Compound

Truss Pipe from Armco Steel Corp. - Sewer & Storm Pipe (Plastic)

T-Top Staples from Firelands Supply Co. - Sod Staples

W. A. E. Paint from W. A. E. Mfg. - Waterproofing

W. A. E. Paint Sealer from W. A. E. Mfg. - Waterproofing

RESEARCH & MATERIALS SECTION

LABORATORY

The Laboratory of the Research and Materials Section consists of four separate testing units (Bituminous, Chemical, Concrete and Soils). Each unit is responsible for testing all materials that fall within the category of that particular unit. The main function of the Laboratory is control testing of materials to assure their conformance to Department specifications. In addition, the Laboratory evaluates many new products submitted by various manufacturers. Laboratory personnel assist in the review and revision of materials specifications and frequently consult and advise Department Engineers on matters relating to materials and their use.

As in past years, the Laboratory was inspected by AASHTO Materials Reference Laboratory and the Cement Concrete Reference Laboratory to insure that all equipment and test procedures conform to established standards.

Following is a brief summary of each unit's activities during the past year:

BITUMINOUS UNIT

The responsibilities of this unit for the past year were both routine control testing and investigation of bituminous materials, mixes, pavements and other related materials which are utilized in the Department's construction and maintenance projects. During the past year, the Department adopted a new specification (viscosity graded) for asphalt cements. It is anticipated that this specification will produce a better quality and longer lasting bituminous pavement. In addition to the required routine testing, this unit performed cooperative tests with the Asphalt Institute on various

BITUMINOUS UNIT (CONT'D)

compounds and masonry protective coatings.

We still are involved with the Bureau of Standards Cement Reference Program, which has expanded to include cooperative testing of Concrete, plus the testing of various aggregate materials with the AASHTO Materials Reference Laboratory. The total number of samples tested during the past fiscal year was 7400.

SOILS UNIT

The primary responsibility of the Soils Unit is the testing of Soils Aggregate.

This testing guarantees the Department of quality control testing of materials used in its highway construction and maintenance projects. Further, the unit provides preliminary data to the Highway Design Section. Materials tested by the Soils Unit are gravel borrow, ordinary borrow, embankment materials, bridge foundation materials, sands, loam, peats and other related materials used in highway construction and maintenance work. Planting materials used in the Department Roadside Beautification Program are inspected for conformance to Department Specifications and American Standards for Nursery Stock. In addition to regular testing, both the U.S. Soil Conservation Service and U.S. Geologic Service (Groundwater and Geologic Survey) submitted numerous samples for testing and classification in accordance with their research project. Related testing is also performed for Mass. Geologic Section and Soils and Foundation Section pertaining to Soil identification, classification and the use of soil. The combined number of samples tested for the Department and related organizations was approximately 600 samples....

SOILS UNIT (CONT'D)

paving mixes. Investigation was also conducted during the winter months on rubberized slurry seal mixtures. The total number of routine samples tested by the unit during the past Fiscal year exceeded 1100.

CHEMICAL UNIT

The Chemical Unit continued its assigned responsibility for testing certain materials used in the work of the Department. Examples of the materials tested by this unit for conformance to specifications are paints, protective coatings, adhesives, glass beads, deicing chemicals, herbicides, pesticides, joint sealers, etc. This unit performed many evaluation studies for the Product Evaluation Committee, and conducted in-house research on paints, protective coatings. The Chemical Unit also advises and consults with Department Engineers on problems pertaining to coatings and feasibility studies on new products. It is responsible for the writing of specifications for paints and protective coatings, in an effort to keep up with the latest developments in these areas. The total number of samples tested by this unit in the past fiscal year was approximately 2100.

CONCRETE UNIT

The primary function of the Concrete Unit is the quality control testing of concrete and its individual components; viz. cement, fine aggregate and coarse aggregate. Subsidiary functions include the evaluation of reinforcing steel, brick, blocks, various types of conduits and pipes, admixtures, proprietary related products and various coatings for cement concrete.

A new piece of equipment, received in 1972; namely the freeze-thaw machine, has seen extensive use in evaluating grout and mortar

RESEARCH AND MATERIALS SECTION

RESEARCH UNIT

More adequate staffing of the Research Unit by transfer within the department has enabled the Research Unit to provide better supervision of the studies involved.

Our Joint Highway Research Project with the Massachusetts Institute of Technology established as a grant in 1950 continued to fill in gaps where expertise was needed. Several small studies have been conducted under this project leading to full scale studies under HPR sponsorship.

The 1973 Highway Research Program for Physical Research HPR I (8); Part II included the following active research.

Number	Title	Researcher	Length of Study	Cost
R5-5	Roadside Development	University of Massachusetts	Five Year	70,000
R-9-0	Small Watersheds	United States Geological Survey	Indefinite	30,000
R-12-2	Movement and Stability of	Massachusetts Institute of Technology	Five Year	60,000
R-12-6	Rapid Frost Susceptibility Test	Massachusetts Institute of Technology	Two Year	80,000
	Mass. Department of Public Works			15,000
R-18-0	Effects of deicing Chemicals Upon	U.S. Geological Survey - Mass. Department of Public Works	Seven Year	50,000
				50,000
R-21-0	Negative Skin	Massachusetts Institute of Technology	Two Year	60,000
		Mass. Department of Public Works		5,000
R-23-0	Behavior of Varved Clays	Massachusetts Institute of Technology	Two Year	60,000

RESEARCH UNIT (CONT'D)

Proposed studies included:

Reflectorization of Traffic Signs

Surface Characteristics of Pavement

Evaluation of Asphalt Specifications

Corrosive Effects of Deicing Chemicals
on Bridge Deck Reinforcement

The Skid Tester for use under the study of "Surface Characteristics of Pavements" was delivered late in the fiscal year. The Roughometer has been completely checked out and malfunctions corrected. Both of these testing vehicles will be used during the coming year.

The Research Unit also coordinated efforts under the contract with United States Geological Survey Water Resources Division with respect to

- (a) Statewide water levels and site investigations
- (b) Investigation of the groundwater hydrology in the Central Boston area
- (c) A study of the effects of highway salt on ground water supplies

and the contract with United States Geological Survey Mineral Branch with respect to geologic mapping, seismic and other geophysical surveys.

Total budgeted cost of research is just under one million dollars a large part of which is reimbursed by the Federal Government.

RESEARCH AND MATERIALS SECTION

SOILS AND FOUNDATIONS UNIT

In the 1973 fiscal year the Soils and Foundations Unit administered seven (7) advertised Boring Contracts valued at approximately \$181,000. These projects were reviewed by the Soils and Foundations Unit when submitted by the various Design Engineers employed by the Department. Complementary Borings Programs for these contracts were also reviewed. Recommendations were forwarded to the Bridge Department and/or the Design Engineer involved.

In the Spring of 1973 the responsibility for the entire contract administration and related duties for the Department's Boring Program was transferred from the Bridge Division to the Soils and Foundations Unit. With this change the Soils and Foundations Unit now is responsible for the entire Subsurface Explorations Program of the Department.

The two (2) Statewide (open-end) boring contracts were also administered by the Soils and Foundations Unit. This work included twenty three (23) projects in Districts 4, 5, 6, 7 and 8, valued at \$37,620.00 and thirteen (13) projects in Districts 1, 2 and 3 valued at \$17,660.00. The Department Boring Crew completed fourteen (14) projects. Some of this work, five (5) projects was done for the Water Resources Division of the United States Geological Survey in connection with the Research project to determine the effects of highway salting on water supplies. The remaining projects were as follows:

RESEARCH & MATERIALS SECTION

SOILS AND FOUNDATIONS UNIT (CONT'D)

Waterways (1), Maintenance (2), Well Projects (3) and Design Borings for Bridges and Highways (3)

Design Bearing Ratios were obtained for fourteen (14) projects throughout the State. Subgrade materials were tested by the California Bearing Ratio method to obtain a Design Bearing Ratio which is used by the Design Engineer to arrive at Pavement Thickness Requirements.

Several Soils Reports submitted by Consulting Engineers were reviewed and comments made to the Design Section. Recommendations were also given by the Soils and Foundations Unit relative to Soils Testing Programs conducted by private agencies.

Approximately forty nine (49) construction projects were visited by the Embankment and Soils Field Control Engineer to check on material incorporated in construction embankments. The Nuclear Density Gauge continues to be a valuable piece of equipment in determining density and moisture content for soils as well as Bituminous Concrete. With the introduction of manufactured crushed stone and dense graded crushed stone for sub-base the Nuclear Density Gauge has become an invaluable piece of equipment to measure density and compactive effort.

The Soils and Foundations' Laboratory continues to perform its routine testing such as gradation, California Bearing Ratio's, Atterberg Limits, organic content, ph determinations, in addition to

RESEARCH & MATERIALS SECTION

SOILS AND FOUNDATIONS UNIT (CONT'D)

certain sophisticated soil tests made on the triaxial testing instrument and oedometer. This equipment has given the Soils and Foundations Unit the capability to perform triaxial and consolidation tests.

Personnel from the Soils and Foundations Unit act as Technical Representatives for the Department's Soils oriented Research with The Massachusetts Institute of Technology. The following is a list of the Soils Research being conducted at M.I.T. for the Department:

R12.2 Movement and Stability of Cuts and Fills

*R12.6 Rapid Frost Susceptibility Test for Massachusetts Soils

R-23 Behavior of Varved Clays

*It is expected that shortly the hardware being developed for this test at M.I.T. will be delivered to the Soils and Foundations Unit and will become operational.

During this fiscal year due largely to the efforts of one employee in the Soils and Foundations Unit the Department's Roughometer was repaired and is operational. Recently the Soils and Foundations Unit took delivery of a skid testing vehicle used for determining the skid resistance qualities of pavements both new and old alike. Personnel in the Soils and Foundations Unit are presently becoming familiar with the operation of this vehicle and hope to have the vehicle operational in the near future. With the Roughometer and Skid Testing vehicles the roughness and skid resistance qualities

RESEARCH & MATERIALS SECTION

SOILS AND FOUNDATIONS UNIT (CONT'D)

of any pavement can be determined and a record of such maintained and used in determining which pavements are in need of resurfacing and/or reconstruction.

RESEARCH & MATERIALS SECTIONFIELD MATERIALS CONTROL UNIT

This unit continued to discharge it's responsibilities for plant produced materials being furnished to the various highway related projects underway during fiscal 1973, including materials from out of state suppliers. This involved the continuous review and approval of all of the 227 bituminous concrete and cement concrete plants, coarse and fine aggregate producers, emulsion and asphalt cement manufacturers in operation, by checking plant production, sampling and testing facilities for conformance with specifications, evaluating bituminous concrete job mix formulas with subsequent check on top course mix by the Marshall Method, reviewing cement concrete mix designs, performing semi-annual sampling of aggregate sources, certified sampling of asphalt cement manufacturers every other week and sampling each batch of emulsion produced by the two main suppliers for state funded work.

Even with the Interstate Highway System substantially completed, the existing Federal Aid Highway Program continues to absorb much of the time and resources of this unit. There were 151 projects in progress which required 179 progress record samplings and plant inspections and 130 final record sampling and project inspections, up slightly from last year. The five fabricators of steel reinforcement, concurrently furnishing material, were also visited and samples taken at each of number 3 through number 11 bars. In conformance with FHWA requirements, a detailed review of documentation of materials quality was conducted for 53 projects, and certificates issued. The continuous cooperation of this unit with the FHWA, in matters involving the control and documentation of materials quality has required several meetings and field trips. It is expected that there will be a marked increase in all functions during the next fiscal year, based on the number and scope of projects now under contract.

FIELD MATERIALS CONTROL UNIT (CONT'D)

The bituminous concrete and cement concrete sections of the materials section of the proposed new Standard Specifications were reviewed and checked in preparation for final publication.

Review, revision and reorganization of the Materials Manual has been in progress and is continuing intermittently. Finalization will be more easily effected when the new Standard Specifications become available.

This unit continues to participate in the in-house research program of the Research and Materials Section. Evaluation of Surge Bins for bituminous concrete storage has not yet been completed. However, interim guide lines have been offered to the District Highway Engineers for their review and comment. Study for use of vibratory rollers on top course of bituminous concrete (contrary to proposed standard specifications) continues. Results to date have been inconclusive. A statewide survey of distressed pavements is still in progress and the evaluation of the field performance of viscosity graded asphalt continues.

B

CONSTRUCTION SECTION

During the 1973 Fiscal Year, the Construction Section of the Department of Public Works provided the engineering supervision and inspection of 63 miles of Highway Construction and concomitant contracts totalling approximately \$107,500,000.00 in value.

The aforementioned variety of projects ranged from a \$1,300 Demolition Project on Route 7 in Pittsfield to \$12,500,000.00 Steel Girder Bascule Bridge spanning the turbulent waters at the estuary of the Merrimack River at Route 1 in Newburyport and Salisbury.

Roadside Development Construction Projects zoomed from less than \$500,000.00 in the previous year to more than \$1,290,000.00 during this period.

Safety Program Projects likewise took a sharp upward trend from slightly over \$1,000,000.00 in the previous year to more than \$12,900,000.00 during this period.

Demolition Projects, alone, amounted to more than \$167,000.00 in contract work.

The TOPICS Program continues its accelerated pace with the award of approximately \$10,445,000.00 in value of contracts

The entire Construction Program is carefully supervised and inspected by our staff of Professional Engineers and Technicians to insure full compliance with Specifications and economical expenditure of the tax payers' dollars.

A detailed analysis of the projects undertaken during the 1973 Fiscal Year Follows.

CONSTRUCTION SECTION

- 2 -

PROJECTS AWARDED DURING FISCAL 1973

INTER STATE
I-86BID

Sturbridge #17087	0.800 Mile	\$6,040,800.40
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I-91

Chicopee-Springfield #17043	Landscaping	145,149.35
Holyoke #16807	Safety	384,280.00
Longmeadow-Springfield #16717	Safety	3,995,974.00
		<u>4,525,403.35</u>

I-91 & I-291

Springfield #16586	Safety	98,648.50
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I-93

Andover-Methuen #16631	6.942 Miles	6,344,542.50
Reading to Andover #16917	9.192 Miles	8,786,237.90
	<u>16.134 Miles</u>	<u>15,130,780.40</u>

I-95

Boston #17062	Demolition	27,000.00
Newburyport-Amesbury #17078	Safety	55,501.00
Boston #16958	Safety	51,525.00
Boston #16809	Demolition	61,444.00
No. Attleborough-Mansfield #16811	Rest Area	549,048.30
Sharon-Norwood #16589	Safety	160,809.00
Norwood-Canton #16590	Safety	89,615.00
Boston #16667	Demolition	27,028.50
Boston #16668	Demolition	11,616.70
Amesbury-Salisbury #17090	Safety	94,530.00
		<u>1,128,117.50</u>

I-195

Somerset-Fall River #16606	Safety	30,882.50
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I-291

Springfield #16605	Safety	56,416.70
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I-295

No. Attleborough-Attleboro #16856	Landscaping	213,535.50
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I-391

Chicopee-Holyoke #16922	Demolition	8,191.00
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CONSTRUCTION SECTION

- 3 -

I-495

Andover-Lawrence #16810	Safety	120,980.00
Tewksbury-Andover #16882	Safety	129,342.50
Chelmsford to Tewksbury #16810	Safety	152,635.00
Lawrence-Methuen #16923	Safety	101,746.00
Hopkinton to Salisbury #16965	Call Boxes	339,616.09
Haverhill #17041	Safety	136,510.00
Haverhill-Merrimack #17046	Safety	140,435.00
Merrimack-Amesbury-Salisbury #17054	Safety	146,532.00
Tewksbury-Andover-Methuen-Haverhill #17069	6.470 Miles	606,998.00
	6.470 Miles	2,454,802.59

PRIMARY, SECONDARY & URBAN

Route 1

Newburyport-Salisbury #16822	0.584 Mile	12,444,964.55
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Routes 1 & 99

Saugus #16884	0.817 Mile	1,390,562.55
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Route 3

Quincy-Boston #16562	Safety	1,286,400.00
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Route 5

Malden-West Springfield #17071	Safety	397,021.00
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Route 6

Farmington-Dennis #16564	Landscaping	282,905.70
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Routes 6, 79 & 138

Fall River #17130	0.855 Mile	6,770,866.45
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Routes 6 & 140

New Bedford-Yarmouth #16565	Safety	19,486.00
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Routes 6 & 240

Airhaven #16904	TOPICS	1,256,275.65
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Route 9

Worcester #16957	Safety	698,821.00
Worcester #16591	0.538 Mile	165,604.62
	0.538 Mile	864,425.62

Route 18

New Bedford #16887	0.549 Mile	4,556,500.00
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CONSTRUCTION SECTION

- 4 -

	<u>Routes 20 & 128</u>	
Waltham #17063	TOPICS	\$ 377,608.00
	<u>Route 27</u>	
Medfield #16792	2.740 Miles	2,193,301.40
	<u>Route 52</u>	
Oxford #17061	3.908 Miles	8,908,157.70
	<u>Route 67</u>	
Warren #16791	Bridge	652,000.00
	<u>Route 113</u>	
West Newbury-Newburyport #16661	0.874 Mile	749,526.25
	<u>Route 126</u>	
Bellingham #16788	2.193 Miles	1,547,496.70
	<u>Route 128</u>	
Randolph-Quincy-Braintree #16799	3.600 Miles	3,599,901.67
Westwood-to-Wellesley #16610	Safety	3,186,165.00
Lexington-Burlington-Woburn-Reading #16899	TOPICS	1,257,256.75
Waltham #17134	TOPICS	423,901.00
	<u>3.600 Miles</u>	<u>8,467,224.42</u>
	<u>Route 132</u>	
Barnstable #16600	TOPICS	194,218.00
	<u>Route 135</u>	
Needham #16614	TOPICS	58,089.00
	<u>Route 140</u>	
Gardner-Winchendon #16768	4.995 Miles	2,774,363.00
New Bedford #16563	Landscaping	76,152.50
	<u>4.995 Miles</u>	<u>2,850,515.50</u>
	<u>Route 146</u>	
Sutton-Millbury #16772	6.422 Miles	1,942,085.00
	<u>Charlestown Ave.</u>	
Ston-Cambridge #16613	Prison Pt. Bridge	3,936,000.00
	<u>Dwight St. Extension & State Street</u>	
Springfield #16588	0.383 Mile	334,823.50

CONSTRUCTION SECTION

- 5 -

Brodie Mountain Road

Hancock-Lanesborough #16733

0.985 Mile

\$ 447,336.20

County & Thatcher Sts.

Attleboro #17065

TOPICS

23,260.00

New Dudley St.

Boston #17135

0.400 Mile

864,834.50

Mass. Ave.

Boston #16946

TOPICS

1,368,756.80

Tremont St., Charles St. So.
& Shawmut Ave.

Boston #16,903

0.277 Mile

357,431.50

Access Road

Somerville #16906

TOPICS

241,530.01

Broadway

Somerville #16956

Bridge

838,494.00

Wilson Square

Peabody #16622

Topics

146,210.00

Lexington St.

Waltham #16629

TOPICS

157,993.50

Main St. & North Ave.

Wakefield #16673

TOPICS

84,524.00

North Washington St.

Boston #16676

TOPICS

289,435.75

Atlantic Ave., E. India Row, Milk St.

Boston #16830

0.217 Mile

614,620.00

Alden Road

Cushnet-Fairhaven #16878

TOPICS

269,615.00

CONSTRUCTION SECTION

- 6 -

Broadway-Plains Area

Lawrence #16879	TOPICS	\$293,950.00
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Main & State Streets

Springfield #16876	TOPICS	154,875.10
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Lowell Street

Peabody #16803	TOPICS	696,587.50
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Various Locations

Cambridge #17142	TOPICS	226,675.00
Leominster #17056	TOPICS	449,154.20
Lawrence #17042	TOPICS	271,455.00
Malden #16905	TOPICS	523,406.20
Springfield #16713	TOPICS	115,993.70
Springfield #17064	TOPICS	264,504.15
Springfield #16875	TOPICS	267,338.72
Waltham #16847	TOPICS	243,372.00
Winchester #16962	TOPICS	178,996.10
Boston #16877	TOPICS	219,960.10
Taunton #16808	TOPICS	58,666.00
Taunton #16814	TOPICS	106,137.70
Dedham #16760	TOPICS	153,369.50
Swampscott #16630	TOPICS	72,012.00
		<u>3,151,040.37</u>

Various Highways

Statewide #16815	Safety	147,275.00
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MISCELLANEOUS NON-FEDERAL AID PROJECTSRoute 1

Westwood #16913	Safety	7,722.77
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Middle Rd. & Route 1

Newbury #17028	Demolition	1,799.00
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Route 2

Arlington-Belmont #16949	Safety	8,062.00
Concord #16801	Safety	489,581.00
Acton #16675	Safety	237,970.00
North Adams-Florida #16654	Safety	37,904.00
Arlington #17082	Pedestrian Overpass	110,264.00
		<u>883,781.00</u>

Route 3

Boston #16726	2.100 Miles	314.645.00
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CONSTRUCTION SECTION

- 7 -

Routes 3 & 120

Lexington-Burlington #16660	0.352 Mile	144,240.00
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Route 6

Fairhaven #16735	0.170 Mile	62,170.00
Yarmouth #16820	Safety	32,880.00
	0.170 Mile	95,050.00

Routes 6 & 20

Wareham #16881	Jughandle	29,689.50
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Routes 6 & 132

Barnstable #16921	Parking Area	32,960.25
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Route 6A

Orleans #16855	Safety	22,670.00
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Route 7

Pittsfield #16845	Demolition	1,300.00
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Routes 8 & 9

Pittsfield #17077	Landscaping	19,825.45
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Routes 16 & 122

Uxbridge #16920	Safety	16,225.00
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Route 24

Avon-Randolph #16794	6.600 Miles	2,494,845.75
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Route 25

Wareham #16819	Safety	6,925.00
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Routes 38 & 110

Lowell #17132	Safety	104,725.00
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Route 43

Williamstown #16960	Safety	47,793.10
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Route 52

Worcester #16795	Demolition	5,300.00
Worcester #16821	Demolition	6,484.00
		12,284.00

CONSTRUCTION SECTION

- 8 -

Route I-95

Saugus-Lynn-Peabody #16541	Demolition	\$2,999.00
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Routes 97 & I-495

Haverhill #17055	Demolition	3,750.00
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Route 106

Mansfield #17068	Drainage Improvement	10,950.00
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Route 112

Huntington-Worthington #16950	Safety	50,864.40
Worthington #16666	Safety	25,056.00
		<u>75,920.40</u>

Route 128

Danvers #17089	Demolition	1,475.00
Gloucester #16816	Safety	90,095.00
		<u>91,570.00</u>

Route 129

Wilmington #17143	Demolition	4,370.00
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J. F. Fitzgerald Expressway

Boston #16579	Reconstruction	123,025.00
Boston #17045	Reconstruction	227,997.50
		<u>351,022.50</u>

Southeast Expressway

Boston-Quincy #16959	Safety	44,984.00
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Belmont Avenue.

Lynn #16852	Demolition	1,900.00
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Central Avenue

Boston-Milton #17072	Bridge	625,095.00
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East Leverett Road

Amherst #16662	Bridge	392,356.00
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West Boylston Street

Worcester #16634	Demolition	2,125.00
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Old Winsor Road

Dalton #17128	Bridge	186,899.00
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CONSTRUCTION SECTION

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Commonwealth Ave. to
Charlestate West

Boston #17018	Landscaping	\$3,718.00
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Nash Hill Rd. & East
Main Street

Williamsburg #16849	Bridge	135,887.75
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Various Locations

District No. 2 #16813	Reconstruction	13,996.00
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SUMMARY

	<u>Miles</u>	<u>Amount</u>
INTERSTATE	23.404	\$29,687,578.44
PRIMARY, SECONDARY & URBAN	30.337	71,628,222.22
NON FEDERAL AID	9.222	6,184,013.47
TOTALS	<u>62.963</u>	<u>\$107,499,814.13</u>

CONTRACT ENGINEER SECTION

The Contract Engineer's Section processes the bids for Federal Aid Projects requiring B.P.R. Concurrence, State Highway Construction Projects, Chapter 90 Projects, Maintenance Projects, Waterways Projects, Boring Projects, projects for the construction, reconstruction, alteration, remodeling, repair, or demolition of buildings under the provisions of General Laws, Chapter 149, and Right of Way Projects involving the sale of houses, and the leasing of State-owned property, from bid opening to award of contract and maintains all the necessary records therefore. The prequalification and post-qualification of contractors is administered by this Section and the issuance of Proposal Forms and plans to prospective bidders requires the approval of this Section. Force account agreements with public utilities, cities and towns are reviewed for approval.

MAJOR ACTIVITIES

1. At bid openings all proposals are publicly opened and read subject to verification for arithmetical correctness, examination for informalities and compliance with applicable statutes.

2. After a bid opening all proposals are immediately checked for compliance with requirements. Proposals that are unacceptable due to incompleteness, irregularities, collusion, qualifying clauses, etc., are duly noted and if the deviation is a matter of substance that is prejudicial to the rights of other bidders a recommendation for rejection of such bid is made, on the other hand, a deviation may be merely a matter of form or some immaterial variation from the exact requirements that can be waived by the Commission under the right reserved. In the latter instance, if such bid is the lowest bid submitted, a recommendation will be made that the informality be

CONTRACT ENGINEER SECTION

MAJOR ACTIVITIES (CONT'D)

waived and the project awarded to the low bidder as being in the best interest of the Department. After all bids have been checked and verified a "Summary of Bids" is prepared, printed and collated for distribution to interested Sections, Divisions, District of the Department, contractors who bid on the particular project, and local trade magazines and publications. Copies are retained for the Sections Records.

3. Letters recommending award of rejections are prepared and typed by this Section for the Chief Engineer's signature for presentation to the Board. Such letters are routed to our Fiscal Section for an assignment of funds. For work involving Federal Funds, letters are also prepared and typed for the Chief Engineer's signature, requesting Bureau of Public Roads concurrence in the award or rejection of contracts as required by Federal Regulations.

4. Prequalification Statements submitted by contractors as required by General Laws, Chapter 29, Section 8B are analyzed, computed, and a Rating determined for submission to our Prequalification Committee. Performance Records of Contractors who have previously performed work for this Department are maintained in this Section, and are designed to provide facts and documented data on every completed project and the contractor's performance thereon. Such records provide a source of information for recommendations made by the Contract Engineer to the Prequalification Committee for the determination of Prequalification Ratings or limitations thereon warranted by the facts.

5. For projects for which prequalification is not required, the low bidder and/or the lowest responsible bidder must submit a post-

CONTRACT ENGINEER SECTION

MAJOR ACTIVITIES (CONT'D)

qualification statement, duly signed and sworn to, outlining his experience, equipment and financial resources on forms supplied by this Department. These post-qualifications statements are computed and analyzed exclusively by this Section and on the basis of the computation and analysis a recommendation for award or rejection is made to the Board.

6. Since the enactment of the Prequalification Statutes all requests for Proposals and Plans for bidding purposes have to be cleared and approved by this Section. This policy was adopted so as to prevent the issuance of Proposals and Plans to contractors who are ineligible to bid because of failure to meet the requirements of the Prequalification Statute and Regulations.

7. Records of all activities of this Section are maintained for purposes of documentation and a source of information.

(a) A complete alphabetical file of all contractors who have performed work for this Department is kept current at all times. This file shows the location of each project which the contract has performed, the advertising date, bid opening date, bid amount, date of award, and starting and completion dates.

(b) A card index file for each project awarded, showing date of advertising, opening of bids, date of award, office estimate, bid price, contractor's name and address, contractor's qualification, start of construction, date of completion, extensions of time, if any, and contractor's performance record.

(c) A card file of projects awarded in each city or town, showing name of contractor, type of project, and the starting and completion date of all contracts performed within the city or town.

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CONTRACT ENGINEER SECTION

MAJOR ACTIVITIES (CONT'D)

(d) Prequalified contractors, their prequalification rating and date of expiration.

(e) A list of "Active Bidding Contractors" who submit bids for any project for this Department each calendar year is prepared and maintained.

PROJECTS AWARDED FOR FISCAL YEAR ENDING JUNE 30, 1973

<u>NUMBER</u>	<u>CATEGORY</u>	<u>AMOUNT</u>
87	FEDERAL AID	\$ 98,122,817.71
45	STATE HIGHWAY CONSTRUCTION	7,658,633.22
38	CHAPTER 90	6,797,635.73
264	MAINTENANCE	14,719,172.84
26	WATERWAYS	4,717,807.80
360	TOTAL	\$ 132,016,067.30

DURING THE FISCAL YEAR JULY 1, 1972 to JUNE 30, 1973 A TOTAL OF 330 CONTRACTORS WERE PREQUALIFIED.

FINAL REVIEW SECTION

The work of the FINAL REVIEW SECTION consists of checking each of the quantities for the various items which represent the amount of work done by a contractor in constructing with the Department of Public Works. This checking consists of reviewing all supporting data for each of the various items as recorded in manifold books, pile books, calculation books, time books and other records of the Resident Engineer; the plotting and sub-grading of final roadway, rock and peat cross-sections so that an accurate final pay quantity may be determined; and the computation of borrow pit quantities based on preliminary and final surveys of the borrow areas. After determining each of the final quantities of the various projects, a cost sheet is prepared so that the construction engineer and others may know the cost comparison with bid and allotment amounts, and a careful analysis is made between the Resident Engineer's quantities and the Final's quantities as well as between the Preliminary and Final quantities so that explanations of all differences which exceed 10% may be determined and prepared. Greater use is being made of the computer for deriving accurate pay quantities for Roadway, Rock, Peat and Loam stripping items. A recent innovation, the "Quality Control Ledger", that documents and expedites projects work has proven its worth to the satisfaction of all concerned. A manual of instruction for the preparation of final estimates and reports for highway and bridge projects was prepared.

"Pre-Final" review teams have been formed which consist of 2 or 3 men from the Final Review Section who are requested to visit various projects nearing completion and finalize items directly at the construction site. This operation reduces controversies and expedites

FINAL REVIEW SECTION

the processing of the project because the availability of the Resident Engineer affords the opportunity to solve any differences of opinion immediately and effectively. This procedure has been accepted favorably by the Districts. The following is a "Breakdown" of the value of contracts processed by the Final Review Section during the period from July 1972 through June 1973.....

FINAL REVIEW SECTION

BREAKDOWN VALUE OF CONTRACTS PROCESSED BY THE FINAL REVIEW SECTION

VALUE OF STATE HIGHWAY CONSTRUCTION CONTRACTS:

HAVING FEDERAL AID PARTICIPATION = \$ 87,758,057.66

VALUE OF STATE HIGHWAY CONSTRUCTION CONTRACTS:

NON-FEDERAL AID. = \$ 7,853,100.26

VALUE OF STATE AID (Chapter 90) Contracts: = \$ 8,909,980.22

VALUE OF MAINTENANCE CONTRACTS: = \$ 13,911,237.48

VALUE OF MISCELLANEOUS CONTRACTS: = \$ 226,192.10

(Includes Consultant Services, Boring
Contracts, Boston - (P.W.B. Contracts),
Traffic, etc.)

Total..... \$ 118,658,567.72

NOTE:

Not included in the above totals are eighty-three (83) Federal Estimates (FINAL FEDERAL AID VOUCHERS) which were submitted during the period of July 1972 through June 1973.

PROCEDURES & RECORDS SECTION

THIS SECTION IS RESPONSIBLE FOR THE CONTINUOUS, COMPREHENSIVE AND SYSTEMATIC REVIEW OF THE RECORDS, POLICIES AND PROCEDURES RELATING TO THE TECHNICAL OPERATIONS PERFORMED BY ORGANIZATIONS REPORTING TO THE CHIEF ENGINEER.

V V V

MAJOR ACTIVITIES

A. Project Reviews - Over the past fiscal year, engineering teams from this Section conducted approximately sixty-five (65) In-depth Reviews of active Highway & Bridge Construction Projects throughout the State. The purpose of these on-site inspections is to assure that projects are in compliance with Contract specifications, Department Standard Operating Procedures and other controls, and to render assistance where required. Detailed reports of these reviews are submitted directly to the Chief Engineer, Research & Materials Division, the respective District, and to the Division Office of the Federal Highway Administration.

B. Equal Employment Opportunity - With the designation of the Procedures & Records Engineer as Department EEO Coordinator, this Section was assigned the responsibility for the administration of EEO Provisions in all State Highway Construction Contracts as well as "In-House" provisions under Title VI of the Civil Rights Act of 1968 and the Governor's Code of Fair Practice.

Over the past year, Federal Aid Construction Contracts containing Special Provisions for On-the-Job Training Programs under FHWA Interim Order 7-2(2) and Affirmative Action under Interim Order 7-2(1) increased from a total of twenty-six (26) in 1972 to sixty (60) for 1973.

In addition, effective July 1972, per directive from the Federal

Highway Administration, Home Town Plan Area Special Provisions were incorporated in all Federal Aid Contracts for projects located in the Boston and New Bedford Plan Areas. A total of twenty-three (23) contracts in the Boston area and seven (7) in the New Bedford area were awarded. Briefly, these Plans specify goals to be attained for minority manhours as a percentage of total manhours on the project in each of the construction trades.

Implementation of these Special Provisions requires that personnel from the EEO Unit be in attendance and available for consultation at all Pre-Construction Conferences for Federal Aid Contracts held in District Offices throughout the State and, depending upon their scope, it often is necessary to schedule Post-Preconstruction Meetings with the Contractor to assist in formulating acceptable programs prior to submission to the Department for approval and subsequent FHWA concurrence. Approximately 100 of these meetings were attended over the past year.

With the continued strong emphasis on EEO as a contract obligation, concentrated monitoring is required by the Section's EEO Unit. In this regard, the FHWA has mandated that Quarterly Schedules of Home Office and On-site Compliance Reviews be instituted and strictly adhered to, covering all facets of EEO. Over the past year, a total of forty-seven (47) On-site Project Reviews and sixteen (16) Home Office Compliance Reviews of contractors and subcontractors were conducted. These reviews are made both independently and in company of officials from the Division and Regional Offices of the Federal Highway Administration.

Similar to our Engineering Reviews, reports of the Compliance Reviews and evaluations are submitted directly to the Chief Engineer, District and the Division Office of the FHWA.

Coupled with the implementation of Home Town Plan provisions, reporting requirements of the FHWA have substantially increased the work load of the Section which is responsible for compiling and processing all

necessary statistical reports relating to Equal Employment Opportunity.

1. Evaluation by FHWA

Reflecting the effectiveness of the overall Inspection Program of the Section's Project Review Teams and EEO Unit, are the following excerpts from the Federal Highway Administration's Summary Report of the 1972 Inspection In-depth Program:

"In general, we found the attitude and efforts of the contractors in regard to affirmative action to be improved over the past years."

"The stage inspection summary reports, which were previously forwarded to the Department, indicate that no major statewide findings were developed during the state inspection program. We would like to congratulate the Department for their continued excellent performance on construction inspection. No significant statewide findings on construction inspection have occurred for a number of years now."

"We would like to commend the Department's Procedures & Records Branch for their excellent work in monitoring construction records and activities in the field. The fact that no significant findings have occurred in the past years is due in no small part to the timely reviews by the Procedures & Records inspection teams."

"It is a pleasure to know that FHWA and your Department can work together in a cooperative atmosphere to further the benefits of the construction program for the public good."

Further illustrating the wisdom of assigning the coordination of these two highly sensitive areas under the direction of one administrator is the following quotation from the same FHWA Summary Report:

"On those projects where we found improvements needed in the Contractor's affirmative action program, the Department's Procedures and Records Section had previously identified the project as a problem area or potential problem area in EEO."

C. Standard Operating Procedures - Procedures & Records has continued to review all proposed new or revised Standard Operating Procedures concerning engineering or technical operations. Where necessary, investigations were conducted and SOPs edited to clarify procedures or enunciate policy.

II. SPECIAL ASSIGNMENTS

In several areas, this Section has been involved on a continuous basis for special assignments:

A. Final Vouchers - Personnel have investigated problem areas and resolved questions in order to expedite Federal Reimbursement. Citations forwarded by Fiscal Management have been investigated and reclaims prepared where justified.

B. Construction Safety - After initially preparing an SOP and directives for project personnel in the area of OSHA (Occupational Safety & Health Act) Regulations, this Section has maintained its involvement with Safety by maintaining close liaison with the Division of Industrial Safety, Department of Labor & Industries, and has participated in seminars and meetings held over the past year. The Section's Review Teams include compliance with OSHA Regulations as a prominent feature of their In-depth Review format.

C. Department Census Report - Once again, the Section solicited, collated and summarized the Annual Census of all Department personnel by grade, sex and comparative totals minority groups, as required by Executive Order No. 74 - Governor's Policy of Fair Practices.

D. Youth Opportunity Program - Again, the Section prepared and distributed correspondence soliciting

Contractors and Consultants to provide employment for disadvantaged youths in the Highway Industry. As requested by the FHWA, a final report was submitted listing certain statistical information secured from a survey conducted by the Section. Overall success of the program was voiced in letter to the Department from the Division Engineer, FHWA, which stated in part, "In view of the employment situation last summer, which did not favor maximum employment opportunities for young people, Massachusetts did a commendable job".

E. Construction Seminars - Once again, the Section aided in scheduling and participating in Construction Seminars for Resident Engineers and field personnel.

F. Department EEO Program - In compliance with FHWA Notice (EEO Requirements of Construction Assurances under Fed-Aid Highway Act of 1968), the Section updated the Department's EEO Program concerning the policies and procedures under which EEO matters are to be handled, satisfying twenty-five (25) questions relating to "Contractor Compliance" and "State Department Employment", for submission to the Federal Highway Administration.

G. Title VI Review of Department - As a result of a review of the Department conducted by the FHWA Regional Civil Rights Steering Committee coordinated by this Section, it was recommended by the Committee that some twenty-nine (29) items of Affirmative Action required implementation. Following a study of the recommendations, the Section determined that responsibility for many of the items was not within the jurisdiction of the Department (i.e. Governor's Office, Division of Civil Service, etc.). Correspondence was forwarded to outside agencies listing recommendations that should be implemented and, upon receipt of appropriate responses, an Interim Report was made to the FHWA reflecting positive steps undertaken to implement the recommendations of the Steering Committee.

H. Wetlands Protective Act - This Section was assigned the responsibility of implementing the Law as it applied to Department activities. Form letters were prepared and distributed to all municipalities in the Commonwealth, Design Consultants, Contractor Organizations and our Department Heads to alert and instruct as to provisions of the new Law. A Standard Operating Procedure was prepared and will be distributed in the very near future.

I. Environmental Protection Law - The Section together with other Divisions of the Department was directed by the Chief Engineer to participate in meetings with representatives of Environmental Affairs and the Office of the Secretary of Transportation relative to compliance with Chapter 30, Section 61 & 62 of the General Laws. Personnel of the Section developed a general format for an SOP to outline procedures required to assure compliance with the law.

J. Mass. Action Plan - In compliance with FHWA PPM 90-4 which directs that each State Highway Department in the nation prepare written procedures or processes to be known as the states' so-called "Action Plan", Commissioner Campbell formed a Supervisory Task Force and Action Plan Group to prepare the Department's Action Plan. A representative of the Section was temporarily assigned to the Plan Group to assist in formulating the Plan. At this writing, the Draft copy of the plan has been completed and distributed for review and comment by various divisions of the Department.

III. SPECIAL REVIEWS

A. Hub Testing Review - As a result of allegations by a Special Committee and a Boston newspaper in regard to a contract held by Hub Testing Company in the private sector, Commissioner Campbell appointed a committee to review the performance of

Hub Testing Inspectors on Department projects. Included on this Committee were personnel from this Section. Interviews were conducted with representatives of other agencies and a Questionnaire developed and distributed to all districts in the Department and statements requested from various personnel known to have contact with Hub Testing Company. In late July 1972, the Report of Committee was completed and submitted to the Commissioner.

B. Hired Equipment Rental Rates Review - At the request of the Chief Engineer, the Section joined with the Maintenance and State Aid Divisions to review and update the listing, designation and hourly rental rates for hiring of outside (private) equipment when required by those divisions. This Section secured minimum wage rates from the Department of Labor & Industry and stressed the necessity of compliance with Section 27F of Chapter 149 at joint meetings. New separate rates have been approved by the Board of Commissioners for the Maintenance Division and the State Aid Section.

C. Police Details-Hourly Rates Review - The developing problem brought to the attention of the Chief Engineer by the District Highway Engineers concerning Uniformed Traffic Police was referred to the P&R Section for compilation of material and preparation of questions. Ten (10) questions were prepared requiring policy decisions relative to guidelines, controls and procedures, some of which may require an opinion of the Attorney General.

LIAISON WITH OUTSIDE AGENCIES

A. Federal Highway Administration - In addition to formal contact with the FHWA, personnel of this Section have participated in Seminars and Workshops conducted at the regional and National level. Auditors and Trainees from the FHWA have reviewed the performance of the Section and have accompanied teams on

project reviews with beneficial results.

B. AASHO & AHONAS - These organizations of State Highway Officials have received information and critiques developed at the direction of the Chief Engineer and Commissioner for presentation before technical working committees.

C. Other States - Acting as liaison for the Department, this Section has prepared replies to general and specific inquiries from sister states.

D. Contractor Organizations - A productive relationship of mutual benefit has been maintained with the NERBA, MATCO and AGC organizations. Of particular note, are contributions relative to EEO and construction safety.

E. Unions - The cordial relationship of this Section with the Highway Industry Trade Unions has aided in reducing tensions in the introduction and involvement of minorities in training and employment.

F. Minority Organizations - The Section has continued to foster a working liaison with minority organizations throughout the Commonwealth, not only in the area of Contract projects, but by promoting minority employment with the Department and State Service. The introduction of Hometown Plans in the Boston and New Bedford Areas has intensified the need for cooperative effort and ready communications in these locations.

G. Other Departments-Agencies - Via meetings and correspondence, the Section has performed liaison with the Departments of Natural Resources, Labor & Industries, Mass. Commission Against Discrimination, Administration & Finance, and have been contacted by other Agencies on occasion.

In summary, the Section has satisfactorily assumed and performed assigned responsibilities relative to records, policies and procedures and, further, contributed immeasurably in other sensitive areas when called upon. This can be attributed to the calibre of personnel and to the direction, endorsement and support of the Chief Engineer.

C

MAINTENANCE SECTIONCONFERENCES AND MEETINGS

Following is the Annual Report of the Maintenance Section for work performed during the Fiscal Year 1973.

This Report reviews accomplishments, recommends Legislation and contains information relative to each operating Maintenance Unit.

During Fiscal Year 1973 conferences were held under the chairmanship of J. F. Kelley for the following Units:

Snow and Ice
Permits
Personnel
Traffic
Highways
Equipment
Roadsides
Structures
Maps and Statistics
Radio Communications

All District Highway Engineers, District Maintenance Engineers and their respective Unit Assistants were present and/or represented at these conferences. The purpose of said conferences was to discuss various Maintenance policies, review problems and re-affirm uniformity of operations.

The Structures Maintenance Engineer conducted an Underwater Diving Training Program for nineteen engineers. The Program consisted of lessons in scuba diving held at the following locations:

January 6 to January 31, 1973 - Massachusetts State Police
Training Academy in Framingham
June 18 to June 29, 1973 - Massachusetts Maritime Academy,
Buzzards Bay and Polley's Cove
in Gloucester,
and one week at the Massachusetts C. D. Training Academy in
Topsfield.

The Maintenance Engineer is Chairman of the Highway Research Board Committee "Roadside Maintenance". As such, he presided over a formal session on Roadside Maintenance and a Committee Meeting at the Annual Meeting in January of 1973 in Washington, D. C. He is also a member of two other Committees, "Maintenance Equipment" and "Maintenance and Operations Personnel".

MAINTENANCE SECTION

REGULATORY PERMITS

July 1, 1972 ----- July 1, 1973

During the year the following permits were issued by the Boston Office:

	<u>No. of Permits</u>
Heavy Equipment, House Trailers and Buildings	24,450
Utilities	523
Driveways	<u>118</u>
Total	25,099

During Fiscal Year 1973, 2,050 permits have been issued via telegram.

During Fiscal Year 1973, 13,244 permits have been issued via transceiver.

EQUIPMENT

THE FOLLOWING EQUIPMENT WAS PURCHASED IN THE 1973 FISCAL YEAR

<u>NUMBER</u>	<u>REPLACEMENT</u>
18	Pickup Trucks
24	Pickup Trucks (Radio Equipped)
20	Pickup Trucks (6 Man Cab)
5	Electric Utility Trucks
8	Aerial Basket Trucks
1	Sander Truck
3	Sweepers
2	Front End Loaders

ADDITIONAL

1	Roller Attachment for Applicator
1	Elec. hyd. Press
1	DeWalt Metal Cutter
1	Miller Machine Horizontal
1	Applicator Machine 48 inch
4	Post Driver Guard Rail
2	Woodchipper
1	Stump Remover
3	Trailer w/Flasher

RADIO

THE FOLLOWING EQUIPMENT WAS PURCHASED

6	Mobile Radio Units
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MAINTENANCE SECTION

TWO-WAY RADIO COMMUNICATIONS

The Department's Two-Way Radio Communication Network licensed by the Federal Communications Commission and operated and maintained by Maintenance Personnel in accordance with the provisions of Part 89 of the Commission's Rules, regulating conduct of the Highway Maintenance Radio Service, continued to provide an efficient means of communications during the routine and emergency activities of the Department during the year.

At the present time the network consists of the following units:

MAINTENANCE SECTION

- A. 1 Monitor Control Station
- B. 10 District Base Stations
- C. 5 Microwave Links with Related Terminals
- D. 8 Auxiliary Base Stations
- E. 6 Auxiliary Civil Defense Stations
- F. 2 Emergency Portable Stations
- G. 395 Mobile Stations in Cars and Trucks
- H. 30 Citizen's Band Portables and related "Walkie Talkies"
- I. 12 Monitor Receivers for Storm Emergency Message Reception

Upon recommendation of communications personnel of the Department and under the supervision of the Maintenance Engineer the program of preventive maintenance applicable to fixed radio installations was continued and a program of replacement of base and mobile units was implemented whereby compact transistorized equipment is replacing tubed dual unit mobiles and solid state equipment is replacing tubed base station equipment as far as budgetary limitations will permit. There is every indication that savings in material and labor will offset initial costs.

In Fiscal 1973 six (6) new mobile units were procured without trade of existing equipment and with characteristic foresight the Maintenance Engineer approved a change in policy whereby mobile specifications were written into vehicle procurement specifications so that twenty-four (24) new radio equipped "pickups" were added to the Department fleet. All of this equipment has four (4) channel capability in anticipation of the addition of two (2) more frequencies. It is noted that at the Fiscal Year's end the Federal Communications Commission had granted authorization to test these two (2) new frequencies with adjacent State Highway users in Pennsylvania, New Jersey, Connecticut and Vermont.

TWO-WAY RADIO COMMUNICATIONS (CONT'D)

Due to budgetary limitations it was not possible to implement the base station replacement program during the Fiscal Year but plans were reviewed and on the recommendation of Associate Commissioner Thomas G. Barlow, it is expected that some utilization of "phased out" Air Force installations can be utilized in District 2 which will supplement the existing single station, no auxiliary problem and improve communications within the hilly perimeters of District 2. Consideration has also been given to an auxiliary installation at Skinner State Park on Mount Holyoke assuming cooperation of the managing Agency. A similar lack of auxiliary equipment in District 5 is being studied by Communications personnel with a view to utilizing salvaged equipment from the replaced units in Districts one, three and eight.

The matter of an auxiliary generator to power radio equipment and lights at Department Headquarters at 100 Nashua Street has been reviewed and it is understood that surplus Civil Defense equipment may be adaptable and available for this purpose in Fiscal 1974.

In furtherance of the Department's Highway Safety Program this unit provided communications for and assisted in arranging for operation of twenty-two (22) Holiday Highway Motorist's Aid Patrols on limited access highways in Districts 4, 5, 6, 7 and 8 during peak traffic periods on the long Holiday week-ends of Memorial Day, Independence Day and Labor Day. Some reduction in the hours of operation of the patrols was necessary due to budgetary restrictions.

The purpose of the operation was to relieve Police for enforcement duties by performance of routine and emergency highway maintenance functions.

These operations were successful and appear to have been well received by the traveling public as indicated by favorable comments in Metropolitan and Suburban news media.

The fog alerting procedure, established as an innovation by the Maintenance Engineer and the Snow and Ice Control Staff, whereby the State Police are informed via teletype by the communications unit of possible fog problems on State Highways based on best available forecast data and upon receipt of confirmation from the State Police, of the development of a foggy, hazardous driving condition, the Maintenance Engineer or certain designated alternates alerts State Forces via the Communications Unit to take appropriate warning action in the foggy areas, thereby safeguarding the traveling public, continued in operation throughout the year.

During the Fiscal Year members of the Communications Unit attended certain "Snow Schools" held in the Districts and instructed base and mobile operators in proper message techniques.

TWO-WAY RADIO COMMUNICATIONS (CONT'D)

With the shortage of available frequencies and the steady increase in mobile use of this message medium, strict adherence to good message handling techniques appears to be the only solution for avoiding harmful interference to Department users during stormy periods.

As previously noted, procurement of four (4) channel equipment and two (2) additional frequencies should alleviate this interference problem to a considerable extent.

In compliance with the requirements of the Federal Communications Commission, schedules and tabulation sheets were prepared and vehicular movements were coordinated in the conduct of the annual frequency measurements on mobile radio units.

Forethought in the procurement of Gersch and Cushman Frequency meters began to repay the Department's investment by producing certifiable primary frequency measurements acceptable to the F.C.C. and provided positive assurance against "drifts" into other assigned areas of operation. Use of the equipment eliminated reliance on a contract service with consequent savings and increased efficiency in operations.

The aforesaid radio maintenance personnel continued to perform preventive maintenance and emergency repairs on Department radio equipment with priority being given to base station operations. "Outs" and operating costs were kept at a reasonable minimum.

In accordance with Legislative Mandate and Department policy the two way radio network of this Department was coordinated with the State and Federal Civil Defense Agencies. Consultation was also held with the Department's Liaison Engineer at M.C.D.A. and Communication Dispatcher instructed in reception of information from severe storm spotters whose field observations are transmitted via the Nashua Street Radio Room to M.C.D.A. for further transmission to Logan Airport via "NMAAS".

The Department's Auxiliary Civil Defense Network consists of Base Stations licensed to operate on Department Frequencies and located as follows:

- | | |
|------------------|-----------------|
| 1. State Control | Framingham |
| 2. Area | 1 - Tewksbury |
| 3. Area | 2 - Bridgewater |
| 4. Area | 2 - (Sector 20) |
| 5. Area | West Dennis |
| 6. Area | 3 - Westborough |
| | 4 - Belchertown |

MAINTENANCE SECTION

TWO-WAY RADIO COMMUNICATIONS (CONT'D)

Mobile operations are conducted by use of the State-Wide Network authorized in the Department's license for the Call Sign KA - 8171 and there is a mobile station for this Department in the Civil Defense Mobile Station van.

The emergency communications net, which was established to provide a liaison apparatus with the United States Bureau of Public Roads and related Federal Agencies in the Boston area for the relay of Federal Defense Conditions messages continued to be maintained on a standby basis.

Assistance was provided by the Maintenance Communications Unit in the preparation of radio maintenance and repair contracts in order to insure uninterrupted communications to the Districts by assuring the services of a reputable contractor in each District in accordance with the provisions of Chapter 29, Section 8A of the Massachusetts General Laws.

Representation was provided by the Communications Unit at Meetings called by the Department of Natural Resources for the purpose of consolidating certain microwave facilities of this and other State Agencies on Mount Wachusett in Princeton, Massachusetts in one highly secure and modern transmitter housing. Because of the many adaptations to the various Agencies requests and environmental impact factors, progress in this matter is slow but an estimated date of 1975 for this desirable change over appears reasonable at this time. It has been stipulated by this Department through its representatives that no expense other than the minimal cost of a physical equipment relocation will be incurred in this desirable rearrangement which will have an assured auxiliary power source and maximum security against vandalism.

In accordance with a request from the American Association of State Highway Officials, the Deputy Chief Engineer for Highway Maintenance agreed to serve as Member for Massachusetts on the AASHO Subcommittee on Communications, whose function is to coordinate applications for frequency allocations in the Highway Maintenance Radio Service and local Government Radio Service with the Federal Communications Commission and other Public Safety Radio Service Committees and users.

While the function of the indicated Subcommittee is advisory and does not bind the Commission or the applicant, the Commission states in its Rules and Regulations that, in its absence, proof of notification and concurrence to all co-

MAINTENANCE SECTIONTWO-WAY RADIO COMMUNICATIONS (CONT'D)

channel and adjacent frequency users within a radius of 75 miles or a costly engineering survey must be provided with the application. In the course of the Fiscal Year 150 applicants availed themselves of this Public Service either on their own behalf or through an authorized coordinator in the Public Safety Radio Service.

MAINTENANCE SECTIONMAPS AND STATISTICS UNIT

The Maps and Statistics Unit of the M.D.P.W. Maintenance Section is the repository and curatorial segment of said organization for maintaining files, maps, plans, charts and pertinent compendiums of statistical data related to various functions and aspects of this unit regarding the Commonwealth's system of State Highways and Bridges. These data consist of such physical properties of the referenced items as location, identity, length, width, thickness of pavement, shoulders, foundations, and year built together with additional information as to the work having been performed under the program of construction, reconstruction, or resurfacing projects.

Records and data are made available regarding maintenance expenditures, cost comparisons, and various analyses through the efforts of this unit intermittently as required by the Department.

Most of the above highway and bridge data have been computerized and a breakdown of such data is available as the occasion for Department need and use may arise.

The following maps may be obtained from this unit: -

1. Wide Snow Map which is annually submitted to the Board of Commissioners for official approval prior to release.
2. A Snow and Ice Control Map for each of the individual eight districts.
3. Route Coding Map of the entire state on a scale of one inch equalling four miles.
4. Maps delineating each of the five Legislative Areas in the Commonwealth.
5. State Map of Cities and Towns delineating County Lines.
6. State Map of Cities and Towns delineating MDPW District Lines.
7. State Map of Cities and Towns delineating MDPW Highway Repair Section Foreman's Headquarters - each of the eight districts.
8. State Map of Cities and Towns delineating MDPW Highway Repair Sections within each of the eight districts.
9. State Map of Cities and Towns delineating Federal Aid Primary and Federal Aid Secondary Highway Systems on a scale of one inch equalling four miles.

MAPS AND STATISTICS UNIT (CONT'D)

10. Overlay Maps of each of the eight districts delineating existing Highway Systems in each District.
11. County Series Maps of each individual City and Town on a scale of one inch equalling one half mile.
12. County Series Maps of each individual City and Town on a scale of one inch equalling one mile.
13. U. S. Geological Topographic Maps of all the sections of the State consisting of some 215 sheets.
14. Index Map of all the U. S. Geological Topographic Maps of all the sections of the State.
15. Official Transportation Map of the State.
16. Individual City and Town Maps on file for reference and office use only.

The above maps are continually being made current; the supply periodically replenished; and intermittently dispensed as requested.

In addition to the above maps, the Maps and Statistics Unit has on file the following sources of data: -

1. Highway Route Data
2. Identification of Highway Route Numbers
3. Identification of Auto Route Numbers
4. Route Book for each of the eight districts.
5. Indexed Chronological Historical Data Relative to Highways - viz. - Construction completion, Reconstruction, Physical Modifications such as widenings, Relocations, etc.
6. Copies of Highway Layouts as currently revised.
7. Alphabetical Listing of all 39 Cities and 312 Towns and their respective identities by district jurisdiction.
8. Procedure for establishing Lane Mile Data
9. Lane Mile Data
10. Lane Mile Data for determining and establishing Personnel Assignments to Repair Crews of each section for each district.
11. Lineal Mile Data
12. File of Semi-Monthly Travel Condition Reports from each of the eight districts.
13. File of Annual Maintenance Inspection Reports for Highways and Bridges from each of the eight districts.

MAPS AND STATISTICS UNIT (CONT'D)

14. Expenditure Tabulations of various Maintenance Accounts for the Fiscal Year for each of the eight districts.
15. Tabulation of Three Digit Coding of all 39 Cities and 312 Towns listed by District jurisdiction.

All these sources of Information and Data on File are continually made current by the Maps and Statistics Unit Personnel.

Further, the Maps and Statistics Unit is perpetually engaged in:-

1. Posting Highway Layout Revisions on the appropriate Maps, Cards Indices, Plans, etc.
2. Revising and Posting Auto Route Numbers on Atlases, Maps, Topographic Sheets, etc.
3. Determination and Assignment of Bridge Maintenance Coding Numbers in adherence to Procedure governing same.
4. Assignment of Coding Numbers for Traffic Lights Locations.
5. Determination and Correction or Confirmation of Data Revisions on U. S. Geological Topographic Sheets as requested by the U. S. Geological Survey of the U. S. Department of the Interior.
6. Dissemination of Information, Data and Material to: -
 - a. Internal Associate Sections, Units, and Personnel of the M.D.P.W.
 - b. Sister Agencies of the Commonwealth
 - c. The Commonwealth's Political Sub-Divisions
 - d. The Commonwealth's Citizenry
 - e. The Public in General
7. Compilation of Decoupages of Board Record Items pertinent to Maintenance activities.

MAINTENANCE SECTION

HIGHWAY MAINTENANCE

For the purpose of maintaining the surfaces of our State Highway System, including drainage facilities, shoulders and guard rails, each of the eight Districts of the State is divided, geographically, into working sections containing, as nearly as possible, ninety (90) lane miles of surface. Due consideration is given to other pertinent factors, such as isolated sections of State Highway, physical barriers etc., and necessary temporary adjustments made during the procedure of establishing the working sections.

Each maintenance section is staffed in accordance with a previously approved staffing formula within the limits of positions and personnel made available to the Department by others.

Maintenance consists of routine physical maintenance work and betterment work. Physical maintenance consists of maintaining the highway and its existing facilities or restoring it to its originally constructed condition and includes surface treatments with liquid bitumens and cover aggregate, or as has been the case almost entirely for the last fifteen years, treatment by the application of bituminous concrete overlays of less than 3/4" in depth.

Betterments include improvements and additions to the originally constructed highway, such as drainage and guard rails and includes overlays of 3/4" depth and over, which represent capital outlays.

Physical maintenance and betterment projects are carried out both by using Department forces and by contract. As our lane mileage increases each year, because of our lack of sufficient personnel and in the interest of economy and allowable time, most of the major items of maintenance, either physical or betterments, are being performed under advertised contracts.

The substance of this report will deal primarily with a summary of major items of physical maintenance carried out by contract, including resurfacing.

PHYSICAL MAINTENANCE

Routine maintenance operations were carried out by Department Maintenance Forces, and included such operations as minor shoulder repairs and certain shoulder or surface treatment with liquid bitumen and sand or stone cover. A regular program is prepared to carry out surface treatment throughout the eight Districts of the State by the application of Class I Bituminous Concrete Type S. T., but this year due to lack of funds there were no such projects advertised.

PHYSICAL MAINTENANCE (CONT'D)

The Department has no maintenance depot or personnel located on the Island of Nantucket, therefore, maintenance of the only State Highway (Siasconset Road) on the Island has been carried out by the Town of Nantucket under a contract with the Department. The sum of \$10,000.00 was allotted for this work.

BETTERMENTS - FORCE ACCOUNT

Two (2) Force Account Betterments, located in District 7 were approved to be carried out by District Maintenance Forces during the year, at a total estimated cost of \$15,660.00. Work performed included new drainage and sidewalk installations.

Eight (8) Betterment Projects, were carried out by contract during the year at a total cost of \$141,000.00. Project work involved new drainage installations, slope and guard rail work, and crack sealing. Approximately \$65,000.00 of this amount was financed from the Accelerated Highway Program.

RESURFACING

Although only \$4,000,000.00 was appropriated and allotted to the regular resurfacing account for Fiscal 1973, an additional \$14,600,000.00 was made available from the Accelerated Highway Program.

Accordingly a total of one hundred and six (106) contracts were awarded during the year for the resurfacing of approximately three hundred and twenty-two (322) miles of highways with Class I Bituminous Concrete Type I-1, varying in widths from 24 feet to over 60 feet and varying in depth from 3/4" to 3".

Considering the fact that the two thousand seven hundred and sixty five (2,765) miles of highway surface has an average life span of fourteen (14) years, it is evident that, even with the aid of Accelerated Highway Funds, additional monies must be devoted to resurfacing in order to maintain an adequate level of service.

MISCELLANEOUS

Preparation of the report on "Quotation Prices per ton for Bituminous Concrete Patching Mix Furnished and Loaded at Plant" was completed following the "Critical Path Method Chart" used for the past couple of years and with additional assistance by the Computer Section.

MAINTENANCE SECTION

MISCELLANEOUS (CONT'D)

In order to avoid a possible lapse in having material available, especially "hot mix", the annual advertising date was changed to coincide with the Fiscal Year, and has proved to be more effective.

Maintenance appropriations are substantially inadequate to properly carry out needed maintenance and betterment operations if we are to keep pace with the constantly increasing mileage of our State Highway System owing largely to the construction of the Interstate System.

Our Highway Design Standards now include many new safety features as specified by the AASHO Traffic Safety Committee. These new standards are usually not incorporated into an existing roadway until it is being reconstructed. In the meantime the majority of our highways continue to lack these betterment type features at the expense of the highway user.

The ever increasing traffic volumes, both rural and urban, plus the anti-skid type winter tires, tend to diminish the effective life of a pavement, thereby increasing the frequency of the need for resurfacing.

Delay in obtaining adequate funds for surface treatments at the time they are initially proposed frequently results in deterioration of the surface where resurfacing becomes necessary at a much greater expense. Likewise, assignment of funds near the end of a Fiscal Year, as has been done in previous years, does not allow sufficient time for the preparation of contracts and completion of the work before the end of the Fiscal Year, at which time use of non-continuing accounts expire.

Our present Fiscal Year Calendar, although compatible with Fiscal operations State-wide, is not in reality conducive to the most economical or efficient method of Highway Maintenance. Due to the seasonal limitation it would seem more beneficial to utilize the "construction season" for construction and the winter season for planning, instead of the present exactly opposite procedure.

MAINTENANCE SECTIONMISCELLANEOUS (CONT'D)

Therefore, it is recommended that:

1. Appropriations for proper maintenance of our Highway System should be in balance with the normal requirements for same.
2. Such steps as necessary be taken from time to time to encourage the Legislature to make provisions for the preceding recommendation by making them constantly aware of the need.

MAINTENANCE SECTION

SNOW AND ICE CONTROL

Snow removal on State Highways is carried out under authority of Section 19, Chapter 81, of the General Laws as amended.

Snow and Ice Control activities include: Responsibility for proper performance of plowing snow, spreading sand and chemicals, erection of snow fences, the clearing of waterways, winter partrolling of the highways, removal of snow from bridges, loading and hauling of snow from certain structures and the clearing of signs and signals. The Snow and Ice Control Section is also responsible for the post season contracts to clean highways and catch basins, the acquisition and improvement of Maintenance Areas and the system of fog warning on highways.

During the 1973 Fiscal Year the Department plowed and treated with sand and chemicals 9,350 lane miles of State Highway.

Snow and Ice Control on Town roads is carried out under the authority of Section 11, Chapter 83, of the General Laws. During the year, the Department cooperated in plowing 475 linear miles of Town Highways. Under the Act, the highways selected were plowed in cooperation with the Town with 50% of the cost being borne by local agencies. However, under date of May 23, 1972, the Board of Commissioners voted to discontinue this program effective the 1974 Fiscal Year, due to high administrative costs and the limited funds being appropriated therefor.

The program for providing industrially pre-mixed sodium and calcium chlorides has continued to improve. In Fiscal year 1973 the Chemical Corporation prosecuted a contract for 36,000 tons in the ratio of five parts sodium to one part calcium (by weight). The cost was \$21.80 per ton. The material blending and its use have been decidedly enhanced through added experience.

The construction of chemical storage sheds continued with an appropriation of another \$300,000.00 from the Legislature. Fourteen (14) sheds were constructed, each being 40 feet wide by 84 feet long, with an intended capacity over 1,000 tons each.

SNOW AND ICE CONTROL (CONT'D)

Presently in process is the acquisition of additional Maintenance Depots in Springfield, Danvers and Swansea and the completion of all needed sanitation and chain link fence requirements from Bond Issue provided.

This coming year steps have been initiated with the administration of the Wellesley Maintenance Depot to improve chemical spreading efficiency by the equipping of 80 spreaders with gear reduction boxes to slow conveyor speed and synchroimeters to synchronize the conveyor speed to compensate for changing vehicle speeds.

An experiment in evaluating the importance of surface temperatures during storms over the known air temperature was begun. A heat sensitive probe was inserted in the Route 128 pavement, electronically connected to a continuous recorder in our Lexington Depot Foreman's Garage.

The concept of two-year contracts was continued this past year for both highway cleaning and catch basin cleaning. The advantage of this coverage is elimination of one year's complete contract processing, preparation, advertising, award -- since each of the aforementioned was to do the same work, in the same areas, during the same season in each of the two succeeding Fiscal Years. This not only serves the Department's best interest but becomes more attractive to Contractors in affording them a year's scheduling in advance and warrant for further investment in their equipment. The concept worked well, with a minimum of problems.

The defense against dense fog's sudden development on high speed highways leading to multiple accidents has been advanced by improved warning systems. The Department's meteorological consultant, Weather Services, Inc., of Bedford, still has written into their contract provision for such forecasting in addition to their usual forecasting services and agreement has been reached with the State Police for observation pursuant to warnings of potential fog development. Department Forces are then alerted for placement of warning devices as conditions deteriorate. It is an initial approach toward serious but somewhat indefinite set of weather phenomena which will depend mainly on improving forecasting techniques.

SNOW AND ICE CONTROL (CONT'D)

The Storm Emergency Center's Communication with the several State Agencies and surrounding Cities and Towns during the past winter was comparatively quiet. During the prior three (3) winters, this media, established to facilitate access to and exodus from the core city, was used effectively on many occasions. Last winter can best be characterized as very severe, an almost continuous sequence of smaller storms (33 average Statewide), with a high frequency of freezing and thawing cycles, plaguing the highway crews and motorists. None were sufficient to incur extensive tie-ups but were of the size and low-temperature variety that cause extensive chemical outlay and must be classified as expensive.

The Snow and Ice Control Engineer is a member of the Highway Research Board Committee on "Snow and Ice" .

MAINTENANCE SECTION

ROADSIDE MAINTENANCE

Activities carried on under the Maintenance Section Roadside Development Unit during Fiscal 1973 consisted of the following contract work: Removal of Trees and Stumps - Mist Blower Spraying - Tree Planting - Tree Trimming - Travel Trash Collection and Mowing of Grass. Normal Force Account Roadside Maintenance activities, such as Vista Clearing - Selective Clearing and Trimming, Brush Control for Safe Sight Distance - Emergency Tree Removal and Trimming along with Litter Pickup - Rest Area and Truck Turnout Improvement and Drainage Ditch Clearance were carried on in all Districts.

The Cooperative Research Program, sponsored jointly, by the Massachusetts Department of Public Works, Federal Highway Administration and the University of Massachusetts, Department of Plant and Soil Sciences of the College of Agriculture has produced and is continuing to produce demonstrative results. Various implementation are being conducted in several Districts as for slope plantings of native seeds, root cuttings, Evergreen Seedlings, Sweetfern and other Container Grown Plants. All are showing remarkable improvements to stabilize slope erosion and minimizing the expensive mowing requirements. Woodchips were also found to be very satisfactory to control erosion on the slopes.

To restore the forest floor in Rest Areas we used Aged Bark mulch - this was very successful. The Roadside Unit is constantly striving to keep informed of all the latest practical and cost saving methods in order to maintain the necessary maintenance of our Highways.

The Highway Landscape Supervisor, in the capacity of Technical Advisor to the Research Program, is able to direct efforts in the field of combating erosion through planting material in the various environments of the State. He is also representative of the Commissioner on the State Pesticide Board and in this position has access to first hand knowledge of desirable and undersirable chemicals used in destruction of harmful insects, weed control and soil sterilization along with instructions in their safe usage.

Budgetary assignments were insufficient to provide a complete program in Liquid Fertilization Spray for Grass and other plant materials, a program in Roadside Maintenance that has not been done since 1968. Additional funds should be made available to accomplish this project if we are to prevent thousands of acres of grass from deteriorating.

MAINTENANCE SECTIONREMOVAL OF TREES AND STUMPS

Dead, diseased and dangerous trees are removed in the interest of highway safety. This work was accomplished on a State-wide basis with 13 separate Contracts for removal of 2327 trees at a cost of \$189,646.00. Removal of Trees that are affected with Dutch Elm Disease is mandatory under the law. Trees that may present hazardous conditions should be removed to protect the public and avoid liability for the Department.

<u>DISTRICT</u>	<u>NO. OF CONTRACTS</u>	<u>TREES REMOVED</u>	<u>COST</u>
1	1	228	\$ 24,035.00
2	2	226	25,380.00
3	3	736	64,620.00
4	2	317	22,494.00
5	2	254	15,837.00
6	1	180	13,230.00
7	1	293	19,270.00
8	<u>1</u>	<u>83</u>	<u>4,780.00</u>
	13	2327	\$189,646.00

MIST BLOWER SPRAY FOR SUPPRESSION OF DUTCH ELM DISEASE

This work was accomplished on a State-wide basis under eight (8) separate contract at a cost of \$57,737.50. Spraying all Elm trees along our roadsides is necessary to protect them from the ravages of Dutch Elm Disease which is spread both by the Elm Bark Beetle and the Elm Leaf Beetle. Spraying for suppression of Dutch Elm Disease is a mandante of the law.

CONTRACT TREE PLANTING

This program consists of planting trees, shrubs, lining out stock, seedlings, and container grown plants along various State Highways under eight (8) separate contracts in eight (8) Districts - contracts totalling \$328,468.00.

The seedlings and lining out stock, and container grown planting is part of our relentless struggle to control erosion and reduce mowing areas.

MAINTENANCE SECTIONCONTAINER GROWN PLANTS

This year and next a total of 200,000 Container grown plants will be planted in all of the eight (8) Districts. This item is being introduced in much larger scale for the coming contracts and we feel that this item will produce the best results in saving money for our tax payers. The method of growing and planting these container grown plants, cost less because they can be planted on slopes or elsewhere in existing soils. (Without Loam) Container grown plants can be planted at any time during the year except when the ground is frozen.

PREVENTIVE ROADSIDE MAINTENANCE

Developing preventive maintenance into over 60,000 acres of land that abuts the 2,800 miles of State Highway, which was originated several years ago, is still being pursued through woodchip mulching and planting of many areas, State-wide, with over 30 species of hardy seedlings, shrubs, ground cover, container grown plants, native seeds, natural growth sods and trees, contingent upon the availability of funds. When the ecology is right, natural growth is induced to fill in the planted area to present naturalistic roadsides.

SELECTIVE CLEARING AND BRUSH REMOVAL FOR SIGHT DISTANCE

No funds were provided to accomplish this work which is directed to highway safety by opening sight distance and exposing background views to the motorist. It is recommended that this work be pursued in order to attain a higher level of safety and to improve the appearance of our highways.

Special attention should be given to the following:

1. Exposing guard rail which may be screened by grass, brush or trees.
2. Reducing the number and extent of passing restrictions.
3. Opening up scenic vistas.
4. Raising the branch level of trees to give height clearance.
5. Improving the visibility of all traffic signs and traffic lights.
6. Improving visibility in the vicinity of turnouts, rest areas, driveways and intersections.
7. Improving the general appearance of the roadside.

MAINTENANCE SECTION

<u>DISTRICTS</u>	<u>TREES</u>	<u>SHRUBS</u>	<u>SEEDLINGS AND LINERS</u>	<u>SWEETFERN (Container Grown)</u>	<u>CONTAINER GROWN</u>
1	283	-	1300	1500	3500
2	407	125	4950	1225	4340
3	25	-	4960	2200	2850
4	1252	-	1500	2500	1500
5	494	160	14900	2000	8200
6	1011	-	6700	1350	7940
7	-	-	7150	3475	3590
8	124	-	-	175	7900
TOTALS	3596	285	41460	14425	39820

TREE TRIMMING

Tree Trimming for Fiscal Year 1973 has been conducted in all eight (8) Districts. The \$90,000.00 in eight (8) contracts, allocated for this work is only a portion of the needed amount of approximately \$350,000.00. Considering the health of the trees and the danger and safety to the traveling public from dead or diseased limbs on 2800 miles of highway this program should be put in a high priority in order to be fully implemented.

TRAVEL TRASH COLLECTION

Travel Trash Collection is in the interest of public health and part of our program to keep 250 Roadside Rest Areas clean. Nine (9) contracts were awarded for the collection and disposal of Department owned barrels for Fiscal 1937 and 1974 along with four (4) contracts awarded for contractor's furnished containers using packer type trucks. The cost is much less than would be the cost of doing this work with Department personnel and equipment. The contract work was awarded for a total of approximately \$166,000 for the next two (2) years.

MOWING OF GRASS ALONG STATE HIGHWAYS

For Fiscal Years 1974 and 1975 - 17 two (2) year contracts were awarded for Districts 2-4-6-8. There were considerable changes by reducing the number of cuts on Limited Access Highways from five (5) to four (4) cuts and on the Non-limited Access Highways from five (5) to three (3) cuts. This was made after a personnel inspection of our roadsides showed that the grass in the past several years has been deteriorating because the necessary funds for Liquid Fertilization to keep grass growing wasn't available. Letting the grass deteriorate will cost millions of dollars to restore the grass areas to its original condition.

MAINTENANCE SECTION

The work is being accomplished in Districts 2-4-6-8 under seventeen (17) contracts along 1120.1 miles of highway at a cost of \$606,350.00 based on a two (2) year contract.

<u>DISTRICT</u>	<u>NO. OF CONTRACTS</u>	<u>MILES</u>	<u>COST</u>
2	4	376.2	\$ 174,700.00
4	5	297.3	173,300.00
6	7	402.1	187,050.00
8	<u>1</u>	<u>44.5</u>	<u>71,300.00</u>
	17	1120.1	\$ 606,350.00

This figure does not reveal the amount encumbered in Fiscal 1973 in Districts 1-3-5 and 7 totalling \$350,000.00.

LIQUID FERTILIZATION SPRAY FOR GRASS

In the past four (4) years this program could not successfully be accomplished because of the lack of funds. Because of this condition we are submitting a program for fertilization this year to protect and vitilize the grass areas before we are faced with the possibility of replacing four (4) or five (5) million dollars of grass areas.

WOOD CHIP UTILIZATION

Wood chips have been used efectively for the past several years for slope erosion. Because of a "no burning" law in Massachusetts, the Department of Public Works plans doing more of our State Highways with all the available wood chips that will be stock piled either in our pits or close to the job for use whenever possible. Over 500 miles of slopes and other areas have been successfully planted and mulched. This method of treating slopes has reduced mowing costs from 25-50% over areas that are all grass on roadsides and along slopes. Chips at a 3" depth in conjunction with the new environmental approach of covering slopes immediately under the prime contract is a natural and practical solution to our erosion problems. There are thousands of cubic yards of wood-chips availabe from construction projects for Roadside Development resulting from trees removed by clearing and grubbing as well as selective clearing and thinning. There is a potential for large quantities of woodchips from these sources.

Wood chips harvested per acre when logs, limbs, branches and undergrowth are reduced to wood chips by a chipper are as follows:

Cape Area (Jack Pine, Scrub Oak, etc.) = 135 c. y. per acre

Stoughton Area (Regular Type Trees) = 210 c. y. per acre

Selective Clearing = 50 to 70 c. y. per acre.

MAINTENANCE SECTION

DITCH CLEARANCE

Obstructions to flow in drainage ditches contribute to soil erosion along our highways and inefficient flow of drainage system discharge. This year District forces will spray vegetation existing in ditches. Current obstructions in ditches should be cleared away under contract as our 1800 miles of ditches will be too much to ask our already undermanned personnel to attempt along with their other necessary duties.

CONSTRUCTION OF ROADSIDE REST AREAS

Modernization of existing rest areas and the critical need of construction of new facilities is considered essential in promotion of travel. Many of our existing rest areas are currently being used beyond a practical capacity.

Certain locations, State-wide, were selected for Roadside Rest Area Construction under the Administration of our past President Johnson's Beautification program. It is apparent that no funds will be forthcoming under this program and other arrangements must be made to provide these critically needed areas as soon as possible.

Recent field observations indicate that we do not have a sufficient number of Rest Areas on some routes. The existing facilities are being put to near capacity use by drivers of both passenger cars and trucks. Weekend observations noted double the usage and a definite lack of sufficient facilities.

Land values are rising rapidly, particularly near new expressways. Further delay in obtaining land and designing areas will make for high cost in future construction. Action should be taken now.

MAINTENANCE SECTION

STRUCTURES MAINTENANCE

BRIDGES

As of July 1, 1973, the Department had maintenance responsibility for a total of 2,510 bridges, having a total workload area of approximately 2,728,400 square yards. This compares to 2,050 bridges and a workload area of 2,406,400 square yards maintained a year ago.

The Department had Operations and Maintenance responsibility for nineteen (19) Drawbridges located over navigable waters.

<u>LOCATION OF DRAWBRIDGES</u>	<u>OPENING DURING 1973</u>
Amesbury-Deer Island Bridge Over Merrimack River	149
Beverly-Salem, Route 1A Over Danvers River	1183
Beverly-Salem, Kernwood Avenue Over Danvers River	1230
Beverly Hall Whitaker Bridge Over Bass River	10
Gloucester, at Blynman Canal Route 127 over Annisquam River	8011
Haverhill-Groveland, Route 97 Over Merrimack River	12
Haverhill-West Newbury Rocks Bridge Over Merrimack River	25
Newbury-Plum Island Turnpike Over Plum Island River	122
Salisbury-Newburyport, Route 1 Over Merrimack River	1577
Braintree-Weymouth Landing Route 3 over Monatiquot River	1
Fall River-Somerset Brightman Street over Taunton River	881
New Bedford-Fairhaven, Route 6 Over Acushnet River	812

MAINTENANCE SECTION

<u>LOCATION OF DRAWBRIDGES</u>	<u>OPENING DURING 1973</u>
Quincy-Weymouth, Route 3A over Weymouth Fore River	509
Westport Point - Route 88 Over Westport River	57
Scituate-Marshfield, Route 3A over North River	8
Tisbury-Oak Bluffs, Beach Road Over Lagoon Pond on Martha's Vineyard Island	345
Boston-Milton, Granite Avenue-Route 3 Over Neponset River	812
Cambridge-Commercial Avenue Over Lechmere Canal	7
Lynn-Saugus, Western Avenue Over Saugus River	<u>2268</u>
TOTAL OPENINGS	18019

CONTRACT MAINTENANCE PROJECTS

<u>City or Town</u>	<u>Location</u>	<u>Work</u>	<u>Cost</u>
Pembroke	Route 3 N.B./Route 139	Bridge Repair (Accident)	\$ 45,210.00 .
Oak Bluffs Tixbury	Beach Road over Lagoon Pond	Operation and Maintenance of Drawbridge	3,400.00
District 8	State Highways	Electrical Maintenance	25,470.00
Chelsea	Washington Avenue/ N. E. Expressway	Bridge Repair (Accident)	16,010.00
Holyoke	Appleton Street/ Second Level Canal	Bridge Repairs	44,380.00
Boston	Pedestrian Overpass/ Route 1 ~ E.B. Expressway	Structural Repairs	15,020.00
Fall River	Wilson Road/Route 24	Bridge Painting	11,400.00

MAINTENANCE SECTION

<u>City or Town</u>	<u>Location</u>	<u>Work</u>	<u>Cost</u>
Freetown	Copicut Road/Route 24	Bridge Painting	\$ 16,500.00
Berkley	Bryant Street/Route 24	Bridge Painting	<u>9,400.00</u>
		TOTAL	\$232,000.00

CONTRACT BETTERMENT PROJECTS

<u>City or Town</u>	<u>Location</u>	<u>Work</u>	<u>Cost</u>
Harvard	Route 110/Route 2	Bridge Improve- ments	\$ 77,810.00
Boston	S.E. Expressway at Neponset Circle	Bridge Deck Betterments	96,800.00
Boston	S. E. Expressway/ Neponset Circle	Bridge Improvements	33,150.00
Boston	East Boston Expressway/R.R. and Road.	Bridge Deck Betterments	35,550.00
New Bedford	Route 195	Roadway	58,240.00
Westport	Route 88	Expansion Joint	
Fall River (2)	Route 44	Improvements	
Chelsea	N. E. Expressway Deck Areas	Bridge Deck Betterments	95,870.00
West Spring- field	Route 5-Tunnel	Safety Improvements to Vehicular Tunnel	<u>47,240.00</u>
		TOTAL	\$ 444,700.00

MAINTENANCE SECTION

BRIDGE INSPECTOR'S TRAINING PROGRAM

Under the Federal-Aid Highway Act of 1968, the United States Congress required the Secretary of Transportation to develop a program to train bridge inspectors.

A Bridge Inspector's Training Program conducted by the Structures Maintenance Section of the Department of Public Works began on January 10, 1972 and ended on February 10, 1972. The course was conducted according to a program that was developed by the Federal Highway Administration. This same course is being used nationally by other States.

Lecturers were selected from experienced Department Engineers. Guest Lecturers, who were experts in their particular topics, also assisted in the program.

All topics concerning bridges were thoroughly discussed. The Classroom instruction was supplemented by actual field inspection. The inspectors were trained to recognize, record, evaluate and report bridge conditions.

A total of 43 Engineers from the Department of Public Works successfully completed the course. The Department of Public Works cooperated with other agencies in the training of Bridge Inspectors. Six Engineers from the Metropolitan District Commission and two Engineers from the Massachusetts Turnpike Authority successfully completed the course. Four Engineers from the Rhode Island Department of Transportation also successfully completed the course.

The purpose of the program was to train Bridge Inspectors to meet the deadline set by the Federal Highway Administration to have all bridges on the Federal Aid System inspected by July of 1973.

Various meetings were held throughout the year with District Bridge Inspectors concerning problems encountered in bridge inspection and bridge inventory. A meeting was also held on the inspection of Overhead Sign Supports. Personnel from the Structures Maintenance Section and a representative from the Federal Highway Administration visited each District during the year to determine the progress of the bridge inspection and bridge inventory and to assist the District Bridge Inspectors in any problems that they may have encountered.

MAINTENANCE SECTION

ACQUISITION OF BRIDGE INSPECTION EQUIPMENT

During the year the Structures Maintenance Section acquired Safety Equipment and Bridge Inspection Equipment through the Federal Highway Safety Project Grant. This Equipment consisted of hard hats, safety vests, rain gear, boots, ladders, boats, cameras, measuring equipment and other related equipment. This equipment will enable our Bridge Inspectors to perform their duties efficiently and safely. The Highway Safety Project Grant is funded by the Federal Government and involves no State funds.

BRIDGE INSPECTION

Throughout the year bridge inspections were underway in all eight Districts in order to meet the deadline set by the Federal Highway Administration to have all bridges on the Federal Aid System inspected by July of 1973.

There are 2429 bridges on the Federal Aid System. 2190 are State owned and 230 are locally owned bridges. The Department is aiding the Cities and Towns and inspecting locally owned bridges on the Federal Aid System.

The inspection of these bridges is substantially complete and the Department has met the deadline.

The Bridge Inspection Program is a continuing program. All bridges will be inspected at least once every two years. The older bridges will be inspected every year.

BRIDGE INVENTORY

The Federal Highway Administration has set July of 1973 as the deadline to have all bridges inventoried. The inventory consists of all data pertaining to bridges. The Districts have prepared inventory cards for all bridges consisting of 72 items. The Structures Maintenance Section codes this information for the Computer.

The bridge inventory has been substantially completed. The Structures Maintenance Section has completed the coding of 41% of the bridges. This information is now in the computer.

MAINTENANCE SECTIONUNDERWATER DIVER TRAINING PROGRAM

Many of our bridges are over water and it will be necessary to inspect underwater elements such as piers, abutments and footings. The Structures Maintenance Section conducted a program to train Engineers in the techniques of Scuba Diving so that they may inspect the underwater elements of our bridges. The training consisted of lessons in an indoor pool supplemented by ocean dives in the vicinity of bridges. The indoor pool lessons were held at the Massachusetts State Police Training Academy on Route 9 in Framingham, from January 8 to January 21, 1973. The morning sessions consisted of instructions in the indoor pool and the afternoon sessions consisted of classroom instructions. The ocean dives were conducted at the Massachusetts Maritime Academy at Buzzards Bay and at Folley's Cove in Gloucester from June 18 to June 29, 1973. The trainees were divided into two groups. Each group stayed one week at the Massachusetts Civil Defense Training Academy at Topsfield. Each day was spent in the water with the instructor and classes of instruction were held in the evening. A written examination culminated the training. Nineteen Department Engineers qualified for certification as Divers.

The Federal Highway Administration funded this program under the Highway Safety Project Grant. It included equipment for each Diver and the cost of the instructor. There were no State funds involved.

This program will enable the Department to do its underwater inspection with Department Engineers and will contribute to the safety of our bridges.

NEW EQUIPMENTUNDER BRIDGE INSPECTION UNIT

The Department is in the process of purchasing an underbridge inspection unit. This is a truck mounted, power operated aerial device consisting of a turret mounted on a truck with three booms and a bucket or working platform.

The purpose of this equipment is to place workmen, quickly and safely, into working position directly under or below bridge roadways for inspection and maintenance duties.

Our Maintenance Forces must now construct staging in order to work under bridge decks. This unit will enable our maintenance forces to perform their duties more efficiently and safely.

MAINTENANCE SECTION

STEEL CORROSION DETECTION DEVICES

Bridge Deck deterioration is a nationwide problem. Part of this problem is the corrosion of the reinforcing steel causing the concrete to crack. A steel corrosion detection device determines the amount of corrosion taking place by measuring the electrical potential.

Another factor in Bridge Deck deterioration is the failure of the waterproofing membrane. A steel corrosion detection device can determine whether or not a membrane is permeable.

A steel corrosion detection device has been purchased for each of our eight Districts. The Bridge Inspection teams will use these devices in determining the condition of our bridge decks so that an efficient program of deck replacement can be established.

BRIDGE PAINTING

No funds were made available for bridge painting during F. Y. 1973.

There was however a special appropriation of funds by the Legislature to paint the Braga Bridge. Braga Bridge carries Interstate Route 195 over the Taunton River from Somerset to Fall River. It is 5,780 feet long and is the longest in the State.

The successful bidder was the Town Hall Contracting Company of Woodside, New York. The contract was awarded on March 14, 1972 with a completion date of May 18, 1973. The Office Estimate was \$784,000.00 and the submitted low bid was \$586,100.00.

This bridge was very difficult to paint. It is a high bridge and beneath it is the U. S. S. Massachusetts with visiting tourists. The U.S.S. Purdy, the U. S.S. Lionfish and other merchant vessels were docked nearby.

The Contractor completed the project on December 1, 1972, six months ahead of schedule. There was a minimum of inconvenience to the traveling public.

The painting of a structure protects the initial investment and retards deterioration. The Structures Maintenance Section considers painting an important part of Bridge Maintenance and hopes that ample funds will be made available in the future.

MAINTENANCE SECTION

CHAPTER 634-ACCEPTANCE OF RAILROAD BRIDGES

Chapter 634 of the Acts of 1971 directs the Department of Public Works to accept the ownership of all bridges over Railroads throughout the State. There are 610 bridges now owned by either the Railroad, the Cities or the Towns that may be transferred to the Department of Public Works.

The Railroad is in bankruptcy and has been doing very little maintenance on its bridges. The Cities and Towns are not financially able to maintain or to replace the bridges over railroads that they own. The Maintenance Section of the Department of Public Works will have the responsibility of maintaining these bridges.

A committee of Department personnel was formed to establish guidelines for an orderly transfer of ownership. The Structures Maintenance Engineer represents the Maintenance Section on this committee and is its secretary. The committee has met twice a month and has resolved many problems pertaining to Chapter 634. The actual transfer of ownership of bridges from the Penn Central Railroad began in November of 1972. Three hundred and three (303) bridges have been transferred and are now the responsibility of the Department of Public Works.

The Boston and Main Railroad have begun negotiations with the Department for the transfer of their bridges. Some of the Cities and Towns have also requested that the Department accept the transfer of their bridges over railroads that are locally owned. The committee is setting up guidelines for the acceptance of transfers from the Cities and Towns.

The newly acquired bridges have presented the Department with a serious problem. They have been inspected and many are in a deplorable condition. It has been necessary to post some bridges with restrictive load limits and to close others for the safety of the travelling public. Fourteen (14) bridges have been closed throughout the State.

Additional personnel will be required in the Boston Structures Maintenance Section. An additional Bridge Repair Crew will be required in each District.

An additional allotment of \$538,500 will be required for additional equipment.

An additional maintenance allotment of \$3,500,000 is urgently needed to repair the closed bridges and to repair others to keep them from being closed. It is the Structures Maintenance Section's hope that the foregoing request for funds be included in the Supplementary Budget.

MAINTENANCE SECTION

BUILDING MAINTENANCE

The contract for a new Foreman's Garage, to be located in District #2 in the Town of West Springfield, was advertised on June 30, 1973. The structure will be of block construction and house three crews. The estimated cost is \$300,000.00. Along with this, it is anticipated to complete the balance of the District #1 Williamstown Garage by adding the garage bays, previously deleted due to unavailable funds. Plans and specifications are about 80% complete. The estimated cost of this project is \$70,000.00.

Pending the availability of funds, it is proposed to build a new Foreman's Garage in the Towns of Ipswich, Lee and Whitman.

A Contract to perform a survey for the replacement and repair of the heating, ventilating and air conditioning for the Research and Materials Building in Wellesley has been completed, and a contract is being prepared to remedy the problems brought to light by the survey. The estimated cost of the repairs and replacement will be \$60,000.00.

A consultant contract is now underway to prepare plans and estimates for various mechanical and electrical deficiencies that exist in the Wellesley Maintenance Depot. It is estimated that this work will cost approximately \$170,000.00.

During Fiscal 1973 contracts were advertised for repairs, replacement and electrification of Overhead Garage Doors at various Maintenance sites located in District #8 and #6.

Contracts for work in the other six Districts are scheduled to be advertised early in Fiscal 1974.

Also for early Fiscal 1974 advertising will be contracts for the installation of gasoline and diesel fuel dispensing facilities at approximately forty maintenance sites throughout the Commonwealth.

Heating and hot water problems that presently exist at the Vine Street Middleboro Foreman's Garage will be eliminated by a new gas heat and hot water system to be installed by a contract early in Fiscal 1974.

Also to be eliminated at the Vine Street Garage will be the sewerage problem resulting from the inadequate septic tank system. The building sanitary system will be connected into the town's sewer line by a contract in early Fiscal 1974.

BUILDING MAINTENANCE (CONT'D)

The organization of the Department of Public Works for Civil Defense and Emergency Planning Operations is based on the State-wide plan for organization of all State agencies for any/all types of emergencies (either natural or enemy caused) and is designed to operate in conjunction with and subject to the general planning of the Massachusetts Civil Defense Agency.

In compliance with a series of Executive and Administrative Orders, issued by his Excellency the Governor, the Department has:

- A. Designated a person to act as its Civil Defense Officer, who is responsible to the Commissioner for Civil Defense and Emergency Planning and Operations within the Department and the coordination of all field operations for the Department with Massachusetts Civil Defense Agency, other State agencies and certain Federal agencies.
 - B. During the past year the Department with the cooperation of the University of Massachusetts Civil Defense training staff completed Emergency Highway Traffic Regulation Emergency Operation Simulation Training in all eight (8) DPW Districts. Said training and testing had shown the need for many changes in the plan. The plan was rewritten and then tested in a State-wide exercise held at the DPW Main Headquarters at 100 Nashua Street including all Districts, personnel from the State Police, Registry of Motor Vehicles, Massachusetts National Guard, Metropolitan District Commission, Federal Highway Administration, Federal and State Civil Defense and representatives from other State Agencies in Region One. From what was learned, it is now intended to have meetings with all concerned to write a plan that completely meets the requirements of State and Federal.
 - C. The Department was included on a State-wide basis in the training of severe storm spotters in cooperation with the National Oceanic and Atmospheric Administration.
- This training included approximately 50 to 60 Department Personnel who are usually on the road in radio equipped vehicles, also an SOP was established in conjunction with Civil Defense requirements.
- D. Continued with the Department's activities in the inspections in the communities affected by the February storms.
 - E. Coordinated the Department's activities during the Plum Island emergency.

BUILDING MAINTENANCE (CONT'D)

- F. Prepared an agreement between the Department and MCDA for the maintenance and testing of the eight (8) State owned pumps. The agreement was signed by the Director MCDA and the Commissioner MDPW.
- G. Arranged for the distribution of sand bags for emergency purposes to be delivered and stacked at the four Area Headquarters.
- H. Supplied and briefed the Commissioner DPW all Associate Commissioners and the Chief Engineer with the rules pertaining to the laws for Chief Executives so that they will better understand the proper procedures in time of emergency.
- I. Continued work on the Department of Public Works Emergency S.O.P. A seminar was held in DPW District One (1) for the purpose of developing a District Emergency S.O.P. which will be included in the State-wide plan.
- J. Prepared and distributed forms for an inventory of Public Works equipment by MCDA Areas. The forms were completed by each community showing the amount of heavy equipment, vehicles and miscellaneous construction equipment, to be utilized during time of emergency.
- K. Further meetings will be held for selected DPW personnel on Civil Defense damage assessment training.
- L. Attended and submitted reports on the Merrimack Valley disaster exercise held in cooperation with the Department of Public Health.
- M. Supplied copies of the Shelter, Fire and evacuation plan that was prepared for the State of Connecticut as requested.
- N. Submitted to the Director, an operations and alerting list for the Department of Public Works.
- O. Supplied MCDA with cost estimates for the DPW following the various emergencies during this period.
- P. Prepared Engineering Bulletin 72-1, to be approved, covering the authority to order the DPW to assist in emergency situations.

MAINTENANCE SECTIONEXPERIMENTAL WORK

As in previous years, the Structures Maintenance Unit continued with experimental work with the cooperation of the Wellesley Research and Materials Section and District personnel.

As a result of a reduction of monies available for experimental work and the extreme work load placed on District Maintenance forces, there were only a few projects undertaken in the Fiscal Year.

NEW PROJECTSDistrict #2

A one half inch epoxy mortar overlay was placed on the Route 2A bridge deck which crosses the Green River in the Town of Greenfield. The material used was EIP-TOP 100, as manufactured by Celanese Coatings Company. The material was installed in the same manner as the installation made on Route 24, Avon, in June 1971. The material was placed in September 1971. The material shows signs of abrasive wear and cracks are numerous. These do not appear to be reflective cracks since the concrete deck was in good condition. The material has also become brittle.

District #4

An EPI-TOP 100 broadcast system was applied to the Main Street-Engell Road bridge over Route #9 in Framingham in June of 1972. Work was performed by District Forces under the supervision of representatives of the Celanese Coatings Company.

A prime coat of EIP-TOP 100 was applied with rollers. One lane was sandblasted, the remaining lanes were just air cleaned. The concrete deck surface was preheated to a temperature of 180° F. A broadcast of fine silica aggregate was applied. A second coat of EIP-TOP 100 was applied with rollers. Sand blasting sand was applied by air and silica sand was hand broadcast.

The prime purpose of the overlay was to seal the concrete surface from deterioration by salts. A secondary purpose was to provide an additional wearing surface to the concrete decks.

As a wearing surface the material has failed.

District #4 (cont'd)

Cores were taken in April 1973. These showed that there was little or no penetration of the epoxy into the concrete deck. This tends to possibly rule out the use of the material as a protective coat.

Additional cores are to be taken and the project will be inspected periodically for further evaluation.

Districts #6 - #7 and #8

A new cement concrete patching material was used in Districts #6, #7 and #8 during the period from July 1972 to January 1973.

The material is a gypsum cement product, manufactured by United States Gypsum Company, having a trade name "DURACAL".

To illustrate; District #8 used the material on the Northeast Expressway, Bridge No. C-9-7, Maintenance No. 095-801-010, during January 1973. The work was performed by Department Maintenance labor personnel.

Two areas were prepared for patching. The areas were precut with a concrete saw and the deteriorated concrete removed. On one patch, two sides were not cut to ascertain if there would be any marked difference in the longevity of the patch.

One patch was filled by using one bag (100 lbs./Bag) of "DURACAL" to approximately three gallons of water. The other patch was filled using a mixture of "DURACAL" and sand in a one to one ratio and mixed with approximately 3.5 gallons per bag.

The areas that were patched will be inspected periodically for evaluation.

AVON - Route #24 over South Street - Northbound

Material: Con/Chen-Cono Crete - Appears to be in good condition.
Minor wear in spots has been noticed.

PROPOSED PROJECTS

Birds: District #6 plans to continue the never ending battle against the damage done to our structures by birds. It is proposed that the work be done by contract, utilizing the product "Rid-A-Bird", which has proved to be very effective.

MAINTENANCE SECTION

TRAFFIC MAINTENANCE

GENERAL

In Fiscal 1973 the Traffic Maintenance Unit continued to feel the effects of the new Federal guide lines in regards to Traffic Control Devices. The guide lines embodied in the Federal MUTCD were substantially accepted and incorporated into the Massachusetts Manual on Uniform Traffic Control Devices.

The Federal Government has allowed variable lengths of time to change over existing traffic control devices to the new system. The proposed dates for the conversion are as follows:

Pavement Markings	1972
Signs	1974
Signal	1976

The changeover on the pavement markings was completed with no outstanding problem except for an added cost of materials. There was much more yellow pavement marking material used in Fiscal Years 1972 and 1973 due to the standard changes. In Fiscal 1973 the yellow material (paint) was \$0.22/gallon more than the white. It is estimated that there has been approximately 40,000 gallon increase in yellow paint/yr. since the changeover.

The changing over to the new standards such as the big increase in yellow traffic paint causes stresses on the supply of raw materials for these products. For instance at this time the paint manufacturers are having a difficult time securing the yellow pigments used for traffic paint.

The changeover for the signs (more graphics) and signals to the new designs is estimated to take longer than the target dates established by the Federal Government. This will be true if normal funding is the only resource available for the work. Of late there have been more and more infusions of funds from Federal sources and other State sources to accomplish statewide "one shot" programs. Some examples of this are the mileage marker system, "wrong way go back" signing system, and the topics programs.

There is no doubt that the aforementioned funding relieves traffic maintenance of the necessity of programming such work from routine maintenance accounts. The only potential drawback to the updating being done is the sophistication being designed into some of the systems. Neither the technical help nor the equipment in some cases exists in the maintenance

TRAFFIC MAINTENANCE (CONT'D)

organization to adequately maintain the more advanced systems.

There still remains certain areas of Traffic Maintenance operations that are not either being funded or staffed adequately to provide the taxpayer with the maintenance service expected after installation of traffic control devices. This is especially true in the area of highway lighting. Priorities must be set in all maintenance work and it is obvious that if there is a choice between the repair of a traffic signal or the repair of a highway safety light the signal must have first priority.

The Traffic Maintenance staffing of field crews must be studied in the very near future if any semblance of normal work routine is to be carried out. Of late it has not been uncommon to take an entire traffic crew away from their normal routines to change, revise or establish a new concept. The present staffing cannot adequately carry out the regular work, therefore the extra work only aggravates a worsening situation.

The same can be said of added field studies that seem to be on the increase lately. Invariably these studies fall on the shoulders of the Traffic Maintenance Field Engineers. It stands to reason that if these personnel do not get time to complete their necessary work, added routines means that something has to be sacrificed. What is being sacrificed is a sensible operating procedure and operations become a "put out the fire" routine.

The following outlines activities in specific areas of Traffic Maintenance during Fiscal 1973.

PERMITS

In Fiscal 1973 some 154 permits for streets and drives were reviewed for approval by the Traffic Maintenance Section. The review entails not only review for standards compliance but an occasional field review.

Meetings - Courses

- A) The Traffic Maintenance Engineer again this year served as Chairman of Highway Research Board Committee A3E05 "Maintenance Operations" and chaired the Committee Meeting in Washington, D.C. in January of 1973.
- B) The Traffic Maintenance Engineer, Sign Maintenance Engineer and Signal Maintenance Engineer attended a refresher course in Highway Engineering Economics during Fiscal 1973.

TRAFFIC MAINTENANCE (CONT'D)

- c) The Annual Traffic Maintenance Meeting was held this year in South Egremont and was a two day meeting, including a night session. Each representative in attendance was a participant in the technical presentations and/or panel discussions. The conference was conducted by the Traffic Maintenance Unit.

Technical Assistance

The Traffic Maintenance Unit contributed to the review and development of the following specifications during Fiscal 1973:

- 1.) Pavement Marking Application - Item 720
- 2.) Construction Warning Devices - Section 850
- 3.) Signal and Lighting Specifications
- 4.) Instituted practice to have the Traffic Maintenance Field Personnel review all proposed signal construction projects.
- 5.) Traffic Signs and Supports - Section 825 plus the standard Drawings for signs and supports.

MAINTENANCE SECTION

TRAFFIC SIGN MAINTENANCE

FORCE ACCOUNT MAINTENANCE

During Fiscal 1973 two of the Districts began a new phase of Force Account Sign Maintenance. This new phase is the installation of round breakaway sign supports.

These breakaway supports are to replace the non-yielding "town line" posts and concrete posts in hazardous locations. They have been used for some time now in sign contracts, but none were installed by Force Account until recently.

The round breakaways require a concrete base either 18" or 24" in diameter by 5'-6" in depth.

Due to the lack of proper equipment the two Districts that did install some of these supports were forced to excavate the foundation holes by hand which is very tedious and time consuming.

Since breakaway supports are to be used for all ground mounted signs, according to Department policy, it is evident that the installation and repair of sign supports will assume a larger portion of the Force Account Sign Maintenance operation in the future than in the past.

CONTRACT SIGN MAINTENANCE

The Traffic Maintenance Unit processed sign orders for approximately 6100 square feet of aluminum extruded billboard guide signs and 130 structural steel breakaway supports that were installed under the provisions of the statewide contract for this work that was awarded during the latter part of Fiscal 1972. The Contract Pay Estimates for this work were also handled by the Traffic Maintenance Unit, based on information submitted by the respective Districts.

There were four contracts for sign maintenance awarded during Fiscal 1973.

The first contract awarded was for Sign Washing in District 8 on the Southeast Expressway, Central Artery and Northeast Expressway at a cost of \$5,185.00.

The other 3 contracts awarded were 3 separate contracts for Sign Washing in Districts 2, 3 and 6. The work in District 2 is on Route 5 from Agawam to Bernardston - District 3 is on Routes I-290 and I-495 and District 6 is Routes I-95, I-195 and 24.

CONTRACT SIGN MAINTENANCE (CONT'D)

The total cost of these 3 contracts is \$14,692.00. These contracts contain Items for Flashing Arrows and Safety Controls for construction operations. The previous contracts for Sign Washing didn't contain these items, which gave Department Forces an added burden of supplying the safety controls.

A Contract Proposal for Service Signs (Gas, Food etc.) with Breakaway Supports was prepared to replace existing Service Signs. This proposal has been held due to proposed Safety Improvement Projects, including signing, for all major routes.

The Annual Statewide Maintenance Contract Proposal should be advertised at the very end of this Fiscal Year. This contract will include items for billboard signs and breakaway supports as it did last year, as well as items for overhead signs, round breakaway supports and excavation of foundation holes for round breakaway supports. The estimated cost for this proposal is \$90,000.00 and these funds will come from the Accelerated Highway Program. This type of contract has been very successful in the two years since it was initiated.

BREAKAWAY SIGN SUPPORTS

During the past Fiscal Year the Districts assumed greater responsibility in the area of breakaway sign support repair.

In a letter from the Maintenance Engineer the Districts were instructed to have the accuracy of their torque wrenches checked at least twice a year. The Traffic Maintenance Unit has given instructions on a simple vise method for this check.

The Traffic Maintenance Unit compiled District reports on wind failures of breakaway sign supports and forwarded this information to the Traffic Engineer. Support failures due to wind loads have not been significant to date.

OVERHEAD SIGNS

There are currently several overhead signs and supports that have been damaged by vehicle impacts, most of which occurred during Fiscal 1973.

The Traffic Maintenance Unit intends to prepare a Contract to repair the overhead installations in Fiscal 1974.

DELINEATION

The maintenance of delineators continues to be a major problem due to their susceptibility to vehicle impact and vandalism.

In an effort to somewhat reduce this problem the Traffic Maintenance Unit initiated the purchase of 8000 flexible plastic delineator posts. Several of these were installed during Fiscal 1973 and up to now early reports indicate that these units usually can withstand multiple hits which is an advantage over existing posts. Installation of the flexible posts is somewhat more difficult than the present post installation.

MILE AND TENTH-OF-MILE MARKERS

Similar in nature to delineators as a Maintenance headache are the Mile and Tenth-of-Mile Markers which were installed on all numbered routes, state highway and non-state highway.

In order to make replacements more readily available to the Districts, the Tenth-of-Mile plates and pressure sensitive numerals have been included in the Annual Reflective Materials Contract.

The Traffic Maintenance Unit has requested that the Superintendent of Shop and Equipment take all action necessary to make these Mile and Tenth-of-Mile Markers available on order.

STATION MARKERS

With the advent of the Milemarker System, some thought has been given to elimination of Station Markers, due to the poor esthetics of the existing markers and also because they are an alleged hazard.

Due to the efforts of the Maintenance Division, the Station Marker System will be retained. All existing facilities are based on the Station System.

The Traffic Maintenance Unit developed a specification for station markers, which consists of aluminum panels mounted on P-9 delineator posts, to replace the concrete markers now being used for station markers.

MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES

Fiscal 1973 has seen the beginning of the transition from word message signs to graphic or symbol signs. This transition will take some time, since it is to be accomplished through the normal sign refurbishment process.

MAINTENANCE SECTION

MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (CONT'D)

The Districts were instructed in a letter from the Maintenance Engineer to order signs according to the Massachusetts "Manual on Uniform Traffic Control Devices", wherever possible.

SIGN RECORDS

The Traffic Maintenance Unit processed the paper work for approximately 1220 sign orders and 1075 weekly sign erection reports.

EXPERIMENTAL WORK

During Fiscal 1973 further evaluation was conducted on certain experimental products and other products were obtained for experimental evaluation, as follows:

1. Experimental plastic "No Parking" signs that were erected in May of 1971 showed pronounced signs of warping when inspected in July of 1972.
2. Several portable metal sign supports were evaluated by the Districts while on display at the Annual Traffic Maintenance Conference and were turned over to the Safety Section for further evaluation.
3. Three aluminum extruded billboard guide signs with procelain enamel backgrounds (non-reflective) were purchased for field evaluation.
4. Stainless steel paint was sprayed on several rusted sign posts in District 6 for field evaluation.

PROPOSED WORK

It is expected that during Fiscal 1974 Traffic Sign Maintenance Work will be focused on the changeover to symbol signs and breakaway supports, as it was during Fiscal 1973.

TRAFFIC SIGNAL MAINTENANCE

The submission of Traffic Signal Reconstruction Projects continued at about the same pace during 1973 as during Fiscal 1972. It is somewhat surprising that the Designers have been able to keep the signal project production stable since there has been a substantial increase in signal installation (from other Fiscal programs) over the past few years.

In Fiscal 1972 there were fifteen signal installations updated to Federal standards and during Fiscal 1973 there were seventeen signal installations updated. The seventeen signals updated this year cost an average of \$10,841.00 per installation.

Fourteen new Traffic Control Signals were installed by contract at an average of \$9,745.00 per installation.

A bright spot in the signal installation area is that new contractors are being attracted to this type of work. Competition in this specialized field will make for reasonable bid prices. With the volume of signal work being conducted the new contractors are most welcome.

Four Traffic Signal Force Account Betterments were completed in Fiscal 1973 by the various Districts with a total expenditure of \$10,123.00.

The work of accomplishing the minor signal repairs and housekeeping (cleaning, painting) by private contractors was continued this year but not on the scale of the previous few years. This could be the result of two things. First, the previously mentioned increase in duties of field personnel and secondly the signals have just recently been painted. Once a signal is painted it can be expected to last for a minimum of three (3) years. This activity will vary in volume from year to year.

Signal Controller repair continues to be a hindrance to efficient maintenance of Traffic Signals. Many controllers have to be sent back to the manufacturers for repairs and three (3) or four (4) weeks in the normal time required to complete the work. It would be so much more efficient to have a technician trained in the solid state field to do at least the trouble shooting and minor repairs on these sophisticated units.

If monies requested are allotted through the Highway Safety Act it will be possible to have five (5) District Traffic Signal Electricians attend a course in Signal work at Georgia Tech University in the Fall of 1973.

MAINTENANCE SECTION

HIGHWAY LIGHTING

As mentioned in the general section of the report highway lighting does not receive the maintenance required for the number of installations in the state. It is a certainty that the maintenance activity is going to have to increase in this area.

Most major construction projects today have highway lighting included in the construction and the heights and location of the lighting units will require specialized equipment that can reach the work site and yet not cause major traffic hazards while in operation.

There are three ways to accomplish the maintenance - these are -

- a) To have the utility companies maintain the installations at a flat yearly fee.
- b) To have private contractors maintain the installations.
- c) To have the state personnel maintain the lighting.

As stated in previous annual reports the legislature from time to time enacts legislation directing the Department to maintain certain areas of highway lighting by private contract. This legislation is useless, the Department already has the power to advertise contracts in this area of maintenance. What is needed instead is a separate expenditure account that is adequately funded to accomplish the work or added personnel to the Department crews to accomplish this work.

PAVEMENT MARKING

FUNDING

The allotment for the Pavement Marking Program remained the same as the last Fiscal period at \$950,000.00. This is responsible funding, and continues to provide the motorist of the Commonwealth with a high level of service in this vital area of safety.

Although the funding is adequate for safety line work it is absolutely frustrating, inefficient and potentially dangerous for unknowing people to impede the processing of contracts for pavement marking application. There have been delays of late where explanations have had to be conveyed to convince people that you can't do the work on a 1/12th basis and that the markings should be done during seasonable weather. On some Contracts in Fiscal 1973 it SNOWED before the Contractor could make the first application, all because Fiscal overseers did not have the grasp of the seriousness of the operation involved.

In pavement marking work it is most efficient to advertise for contracts in July and it is most efficient to advertise the materials contract in November or December. When the work is ready the money must be available and the monthly or 1/12th allotment simply cannot work. It is hoped that costly delays will not be imposed again in Fiscal 1974.

MATERIALS

The policy started in Fiscal 1972 to advertise a 12 month blanket contract for pavement marking materials was continued in 1973. The open end or blanket contracts save time in the processing of paper work.

This year, unlike any other years only chlorinated rubber base paints were purchased in place of strictly cold paints. The primary reason for this is that chlorinated paint is a dual paint that can be applied hot or cold and has the property of greater durability than conventional cold paints.

A limited amount of so called "20 second dry" paint was also purchased. This paint can only be used in the two large paint machines owned by the Department.

MAINTENANCE SECTIONMATERIALS PURCHASED - FISCAL 1973

Sixteen (16) type materials were requisitioned for Fiscal 1973 as follows:

- (1) 44,300 gallons of white fast drying traffic paint (chlorinated)
- (2) 79,500 gallons of yellow fast drying traffic paint (chlorinated)
- (3) 10,000 gallons of white high heat rapid drying traffic paint (20 second dry)
- (4) 15,000 gallons of yellow high heat rapid drying traffic paint (20 second dry)
- (5) 550 gallons of black traffic paint (cold)
- (6) 1,144,000 pounds of glass beads
- (7) 13,265 gallons of toluene thinner
- (8) 31,000 pounds of thermo powder
- (9) 156 pounds of white reflective liquid
- (10) 396 pounds of yellow reflective liquid
- (11) 110 rolls of white reflective lane tape in 4" x 50 yd. rolls
- (12) 75 rolls of yellow reflective lane tape in 4" x 50 yd. rolls
- (13) 20 rolls of black non-reflective lane tape in 4½" x 50 yd. rolls
- (14) 385 gallons of line remover
- (15) 2010 gallons of Polisign (an epoxy)
- (16) 12,000 pounds of thermoplastic

CONTRACTS

The Performance Type Pavement Marking Contracts have proven to be workable type contracts over the period of the past few year but through experience it has been found that they cannot be used everywhere successfully. In the most western District it was determined that the old method of two paintings per year would be adequate, therefore in Fiscal 1974 only two specified painting will be done.

Although the Performance type contract has proven successful it is evident that some type of tailoring must be done to these contracts to get the Contractors to use more durable pavement markings on the high volume highways. The pavement marking performance has improved over the years in that there is nearly always a line on State Highways. However, there still are those periods in the winter-time when continuous cold and inclement weather restricts striping activity. With the more durable type markings such as the thermoplastics or the epoxies there is no need to do any striping during inclement weather because the line will usually last through the winter.

Safety Line Painting was done by contract in six of the eight Highway Districts during 1973. There were twenty-six (26) contracts in existence this year as follows:

- (A) Three (3) median edge line, on Interstate Highways only.
- (B) Four (4) median edge line, for State Highways only.
- (C) Two (2) one year performance contracts.
- (D) Eight (8) two year performance contracts.
- (E) Two (2) resumption of two year performance contracts, beginning during Fiscal "71".
- (F) Six (6) resumption of two year performance contracts, beginning during Fiscal "72".
- (G) One (1) thermoplastic contract for solid and broken lane lines in District 2.

RENTAL EQUIPMENT

Another type of service that has proven successful is the application of pavement markings by renting the striping equipment and supplying Department materials to the rental crew for application. There are at least three (3) concerns that have large capacity hot paint machines for hire in the State.

MAINTENANCE SECTIONCONT'D.RENTAL EQUIPMENT

The rental prices are competitive and compare with the low range of the contract prices for total cost of applied line. The rental method of pavement marking application is preferred in an emergency situation because it eliminates the time consuming paper work both prior to doing the work and after the work is completed. Also the Contractor receives payment for the work much faster. Another advantage of the rental method of applying pavement markings is that the Contractor is called out and paid only when lines are needed. The performance type contracts are difficult to estimate and bid on because of the unknown number of paintings and the specified painting contracts do not cover emergency situations.

EQUIPMENT

Two additional hot paint machines were delivered this year which brings the Department's hot paint units to a total of five. There are eight Districts so it can be seen that a minimum of three (3) more hot paint machines will be required to cover the State.

Also purchased during Fiscal 1973 was a thermoplastic kettle and applicator. The Department now has the capacity to repair deteriorated thermoplastic markings without relying solely on outside Contractors.

With the capability of the Department to apply its own hot paint and on a limited scale, thermoplastic, it is expected that there will be a slight reduction in the total number of future contract proposals. An indication of this trend was seen this spring in the preparation of contracts for Fiscal "74". Conversely, an increase in total quantities of materials purchased for District use can be expected, as long as the Department equipment is available and in good enough condition to perform.

An increase in material purchases also can be expected if the rental of equipment is increased.

EXPERIMENTAL PROJECTS

The following projects are in various stages of experimentation and observation.

- (1) Polisignal - This product is an epoxy and similar when installed to thermoplastic. To date polisignal has shown a satisfactory durability factor. The first application was in August of "71" and was applied manually, but a machine has since been developed to apply the material.

MAINTENANCE SECTION

CONT'D

EXPERIMENTAL PROJECTS

In June of this Fiscal period approximately 100,000 linear feet of polisignal will be applied by the Southwest Petroleum Corp. The Districts selected for this experimentation are Districts 2, 4, 6 and 8.

- (2) Retroreflective Meter - This instrument was observed during a demonstration conducted in Wellesley this year. The basic function of this instrument is to determine numerically the reflective quality of a safety line by means of a light beam. It is believed that this instrument would be of value in the pavement marking program, especially in the evaluation of contract striping.
- (3) Jel Strip - This material is a jelly like substance that can be sprayed from a conventional paint machine. The purpose of this product is to remove pavement markings, although it can be used to remove other type paints. Districts 3 and 5 have had occasion to use Jel Strip, by the method described above - it proved to be successful. All Districts have some of this material.
- (4) Reflectors on Island Curbing - About 18 raised reflectors were installed with epoxy on sloped curbing at a ramp in October of 1972. Little hope was held to have these reflectors remain through the winter. Surprisingly only three of the 18 were lost through the winter, and they do delineate the ramp area. Continued observations will be conducted on these markers.

Again this year much needed research had to be curtailed due to the lack of personnel both in Traffic Maintenance and at the Research and Materials organization.

MAINTENANCE CONTRACT SUMMARY

<u>Section - Type of Work</u>	<u>Number of Contracts</u>	
<u>HIGHWAYS:</u>		
Crack Sealing	2	
Curb	1	
Drainage	4	
Resurfacing	106	
Slope & Highway Guard	1	
Highway Maintenance -		
Nantucket	<u>1</u>	115
<u>ROADSIDES:</u>		
Mowing	96	
Mist Blower Spray	7	
Trash Disposal	14	
Tree Planting	8	
Tree Removal	15	
Tree Trimming	<u>9</u>	149
<u>SNOW & ICE:</u>		
Catch Basin Cleaning	25	
Chemical Sheds	13	
Highway Cleaning	<u>34</u>	72
<u>STRUCTURES:</u>		
Bridge Betterment	6	
Bridge Painting	3	
Bridge Repair	3	
Drawbridge Operation	1	
Electrical Maintenance	1	
Tunnel Improvements	1	
Structural Repairs to		
Pedestrian Overpass	<u>1</u>	16
<u>TRAFFIC:</u>		
Cleaning and Repairing		
Lighting Assemblies	1	
Highway Painting	26	
Signal Construction	14	
Signal Reconstruction	17	
Signal and Flasher		
Maintenance	1	
Traffic Sign Maintenance	4	
T V Maintenance	<u>1</u>	
		<u>64</u>
TOTAL		416

D

BUREAU OF TRANSPORTATION PLANNING & DEVELOPMENT

INTRODUCTION

The Bureau of Transportation Planning and Development, Massachusetts Department of Public Works, was established in 1964 under Section 3A of Chapter 16 of the General Laws. The executive and administrative head of the Bureau is the Director of Transportation Planning and Development.

This Bureau serves as the principal source of transportation planning in the Commonwealth. Over the past year, the Department through the Bureau of Transportation Planning and Development and in coordination with the Executive Office of Transportation and Construction, Federal Agencies and regional and local agencies, has undertaken a major reorganization of the transportation planning and decision-making process throughout the Commonwealth. This reorganization has been aimed at revitalizing the process so as to meet Federal certification requirements and to achieve the goal of the Governor for the cooperative development of balanced transportation systems. The systems are to be accomplished through the implementation of plans developed cooperatively and endorsed jointly by the State, regions, localities and the private sector, within a framework of an open, participatory planning process closely linked to decision-making.

REGIONAL PLANNING AGENCIESRegion 1 - Berkshire County

The Pittsfield Urbanized Area is encompassed within the Berkshire County Regional Planning Commission's (BCRPC) District of the 32 Cities and Towns which comprise Berkshire County.

The Memorandum of Understanding with the EOTC, DPW, and BCRPC as signatories was consummated on November 17, 1972, leading to a new co-ordinated resolve in solving transportation issues.

A Transportation Advisory Group (TAG) was established as directed under the Memorandum of Understanding and was convened on April 4, 1973. This was a major step in revitalizing the 3C process begun under the old Transportation Coordinating Committee.

Also, contract negotiations were completed on June 21, 1973, allowing for the hiring of a Transportation Planner by the BCRPC to work on an Operations Plan, a Unified Work Program, updating the Urbanized Area Report, aiding the TAG in its responsibilities, etc...

The BTP&D regional liaison personnel have been charged with this smooth operation of the 3C process. A representative from the Department attends and participates in all meetings involved in transportation issues establishing a closer liaison with the BCRPC and its community members.

Region 2 - Franklin County

The Regional Planning Agency in this area is the Franklin County Planning Board, representing the 26 towns in the County.

REGIONAL PLANNING AGENCIES - Region 2 Franklin County Cont.

A Memorandum of Understanding between the Secretary of Transportation and Construction, the Commissioner and the Franklin County Planning Board was signed on March 6, 1973.

In order to implement the formation of the Joint Transportation Planning Group (JTPG) as provided for in the Memorandum of Understanding, the Department is currently in the process of hiring an individual to work as staff to the JTPG. This unique method of financing the 3C process was agreed upon by the Department and the Franklin County Planning Board due to problems arising out of funding the County directly.

Region 3 - Lower Pioneer Valley Regional Transportation Study

The study area is comprised of the 43 cities and towns of Hampden and Hampshire Counties which form the Lower Pioneer Valley Regional Planning Commission. A Joint Transportation Committee established as a result of the Memorandum of Understanding, between the Department and the LPVRPC, have been engaged in both long and short term planning for the District needs in all modes of transportation.

A contract was signed between the Department and the LPVRPC effective May 10, 1973, for the funding of LPVRPC staff to assist the Joint Transportation Committee in the comprehensive, continuing cooperative transportation planning process for all forms of transportation in the District.

Department personnel have attended and participated in the Lower Pioneer Valley Regional Planning Commission meetings regularly

BUREAU OF TRANSPORTATION PLANNING & DEVELOPMENT

REGIONAL PLANNING AGENCIES - Region 3 Lower Pioneer Valley cont.

thereby maintaining effective Liaison with the commission members representing individual communities.

Region 4 - Montachusett Planning Region

The original Urban Transportation Study area encompassed two cities and two towns, Fitchburg; Leominster and Lunenburg, Westminster, respectively, which was completed in 1967. The Montachusett Regional Planning Commission began in 1968 consisting of 22 cities and towns in Northern Worcester County with sixteen (16) present paying membership.

In June 1972 a new Memorandum of Understanding with the EOTC, DPW, and MRPC as signers was consummated leading to a new 3C Transportation Planning Process to replace the old Transportation Coordinating Committee. A new Joint Transportation Planning Committee to be formed by MRPC is a grass-roots areawide transportation planning group set up to implement the objectives for open and participatory transportation planning in the Commonwealth and will be engaged in both long and short term planning for all forms of transportation.

The Department is finalizing negotiations with MRPC for a contract to hire staff to serve with the Joint Transportation Committee. The contract will be funded from Federal and State source

The Department has also been negotiating with the Federal Highway Administration for a major update covering the enlarged Montachusett region, for the past two years, but to date have not resolved all of the problems to get the project started.

REGIONAL PLANNING AGENCIESRegion 5 - Worcester Area

This Region consists of 40 communities and is one of the larger areas in the State.

The Central Massachusetts Region is currently in the process of satisfying the requirements for Federal Certification. Their accomplishments toward certification have been as follows:

- a) signed a Memorandum of Understanding relating to the 3C process on September 14, 1972.
- b) signed a Transportation Planning Contract with the Mass D.P.W. on March 20, 1973.
- c) establishment of the Joint Transportation Planning Group, this group will provide program direction.

The Central Massachusetts Regional Planning Agency is currently working on satisfying the following criteria for certification:

- a) develop a unified transportation work program delineating the tasks, organizations and financing necessary to carry the program forward, and
- b) to have the Joint Transportation Planning Group in that region to have an accepted transportation plan as a base for implementing projects.

The decision to use the Regional Planning Agency as the focus for the revitalized transportation planning effort is a decision that apparently will have gratifying results.

Region 6 - Northern Middlesex Area

The Lowell Urbanized Area is encompassed within the Northern

BUREAU OF TRANSPORTATION PLANNING & DEVELOPMENTREGIONAL PLANNING AGENCIES Region 6 - Lowell Urbanized Area cont.

Middlesex Area Commission District (NMAC). The NMAC District is comprised of 9 communities in Middlesex County.

The first annual surveillance report contract between the Commission and the Department was completed. A planning contract for the continuing transportation planning process has been signed between the Commission and the Commonwealth and is presently ongoing. Under a provision of the Contract the Regional Planning Agency has hired a transportation planner.

A Transportation Coordinating Committee was formed for the Northern Middlesex Planning Region in May of 1972 and is presently active in transportation matters for the Region. The Committee is presently meeting monthly in a joint effort between several State Agencies and the local communities to provide a totally integrated and functional group dealing with the short and long range transportation plan for the Region.

Department personnel have attended the Area Commission's monthly meetings and the transportation coordinating committee meeting regularly, thereby establishing good liaison with their members.

Region 7 - Merrimack Valley Planning Commission

The Lawrence-Haverhill Urbanized Area is encompassed within the Merrimack Valley Planning Commission District (MVPC). The MVPC District is comprised of 15 communities in Essex County.

The first Annual Surveillance Report Contract between the Commission and the Department was completed. A Planning Contract

REGIONAL PLANNING AGENCIES - Region 7 - Lawrence-Haverhill Area cont.

for the continuing transportation planning process has been signed between the Commission and the Commonwealth and is presently on-going. Under a provision of the Contract the Regional Planning Agency has hired a transportation planner.

Joint Transportation Planning Committees were formed for the Merrimack Valley Sub-regions in January and are presently active in transportation matters for the Region. The Committees are presently meeting monthly in a joint effort between several State Agencies and the local communities to provide totally integrated and functional groups dealing with the short and long range transportation plan for the region.

Department personnel have attended the area Commission's monthly meetings and the Joint Transportation Planning Committee meeting regularly, thereby establishing good liaison with their members.

Region 8 - Boston Metropolitan Area

Significant and substantial progress has been made in establishing and implementing an effective 3C transportation planning process in this Region. A Memorandum of Understanding was executed by the Executive Office of Transportation and Construction (EOTC), the Mass. Department of Public Works (DPW), the Massachusetts Bay Transportation Authority (MBTA), and the Metropolitan Area Planning Council (MAPC). This Memorandum of Understanding established the framework for 3C planning in the Boston Region. It provided for the formation of a Joint Regional Transportation Committee (JRTC)

BUREAU OF TRANSPORTATION PLANNING & DEVELOPMENT

REGIONAL PLANNING AGENCIES - Region 8 Boston Metropolitan Area cont.

and established the mechanism for planning.

Through an interagency staff effort, a Unified Transportation Work Program and a Operations Plan was prepared and presented to the JRTC for their review. The Unified Transportation Work Program includes all modes of transportation and describes programs that are likely to begin in 1973 and more generally in 1974 to 1977. The Operation Plan describes the manner in which the Work Program will be implemented. It includes a description of the responsibilities of the various groups involved in the 3C process as well as an outline of the planning procedures to be employed.

In addition an "accepted plan statement" was approved by the JRTC which recognizes the need for adopting a transportation plan that is regarded by the State, regional agencies and local communities as a basis for implementation of further planning programs.

The establishment of the JRTC, the execution of the Memorandum of Understanding, the Unified Transportation Work Program and Operations Plan and an accepted plan statement are the basic ingredients which provided the basis for certification by the U.S. Department of Transportation that the 3C transportation planning process required by law is now underway in the Boston Region.

Region 9 - Old Colony Planning Region

The rejuvenation of the comprehensive, continuing, cooperative transportation planning process has successfully been completed in the Old Colony Planning Region. The Region has received certification from the Federal Highway Administration through June 30, 1974.

REGIONAL PLANNING AGENCIES - Region 9 - Old Colony cont.

The first annual surveillance report contract between the commission and the Department was completed. A planning contract for the continuing transportation planning process has been signed between the commission and the Commonwealth and is presently ongoing. Under the provision of the contract the Regional Planning Agency has hired a transportation planner.

A Joint Transportation Committee was formed for the Old Colony Planning Region in February and is presently active in transportation matters for the region.

The committee has accepted a plan, work program and by-laws and is presently meeting monthly in a joint effort between several state agencies and the local communities to provide a totally intergrated and functional group dealing with the short and long range transportation plan for the Region.

Department personnel have attended the Area Commission's monthly meeting and the Joint Transportation planning meeting regularly, thereby establishing good liaison with their members.

Region 10 - Southeastern Massachusetts

The Southeastern Massachusetts Regional Planning and Economic Development District (SRPEDD) is composed of 33 cities and towns in Bristol, Plymouth & Norfolk Counties, including Urbanized Areas of Fall River, New Bedford, Taunton, Plymouth and Attleboro (Providence R. I.).

The Memorandum of Understanding with the EOTC, DPW and SRPEDD was signed on April 6, 1972 revitalizing cooperative transportation

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

REGIONAL PLANNING AGENCIES - Region 10 S. E. Mass. Cont.

planning in Southeastern Massachusetts.

A Joint Transportation Planning Group (JTPG) was formed on May 31, 1972. This Policy Group supervises the actions of all Task Forces formed to investigate and report on various transportation proposals in the region.

The JTPG adopted a Regional Transportation Plan on November 28, 1972 which was based on the S.E. Mass Study (1965) with modifications.

Certification was achieved on January 18, 1973. Several contracts were negotiated with SRPEDD during the period. The latest of which (contract # 16853) was signed on January 19, 1973 covering the Calendar year 1973.

An operations plan and work program were submitted on February 7, 1973. The work program was approved and is now in effect. The operations Plan has been reviewed and is being modified to a unified operations plan compatible with the other Regional Planning Agencies, consistant with BTP&D aims for Transportation Planning Statewide.

The Transportation Planning Section of SRPEDD is divided into two groups.

1. A Highway Planning Section with a full time staff of 3 Transportation Planners & part time help as needed.
2. The Transit Planning Section with a full time staff of 3 Transit Planners with part time help as needed.

REGIONAL PLANNING AGENCIES - Region 10 S. E. Mass. Cont.

Both groups can draw on expertise in related fields when necessary because of the nature of the overall parent organization (SRPEDD).

The DPW District Planning Engineers are in close contact with the SRPEDD Transportation Planning Groups, attending all the JTPG meetings and Task Force meetings in the appropriate Districts.

BTP&D Liaison Personnel also are in daily contact by phone with at least one weekly visit to the SRPEDD office. Liaison personnel also attend the various meetings and coordinate DPW participation.

The 3C process is indeed working in S.E. Mass. The numerous proposed projects in this area have required many meetings with varied response from the public. Consensus opinions have been obtained mostly after a spirited discussion of some length. Progress is being made primarily in the direction of a greater appreciation of the sincere although diverse interests of the people affected by various transportation proposals in this area.

Region 11 - Cape Cod Planning and Economic Development Comm.

During fiscal 1973, the following events took place between the Executive Office of Transportation and Construction - Department of Public Works and the Cape Cod Planning and Economic Development Commission as part of the "3C" process:

1. A memorandum of understanding was entered into on November 3, 1972.
2. A joint transportation committee was formed in accordance with the memorandum of understanding in early spring of 1973.

REGIONAL PLANNING AGENCIES - Region 11 Cape Cod Cont.

Several meetings have taken place.

3. In accordance with provisions of the Memorandum of Understanding, the Department of Public Works with the approval of the Cape Cod Planning and Economic Development Commission and the Joint Transportation Committee has negotiated a contract for a consultant to provide staff support for the transportation planning effort. It is expected that the contract will be signed and the consultant hired by late September 1973.

A tentative unified transportation work program will be reviewed and revised at the time the consultant assumes his planning duties.

Region 12 - Dukes County

The following events took place between the Commonwealth and DCPEDC during fiscal 1973.

1. A memorandum of understanding was entered into on November 29, 1972.
2. A planning contract for the continuing transportation planning process was signed on March 20, 1973, and will be in effect until June 20, 1974.
3. A Joint Transportation Committee was formed in accordance with the memorandum of understanding, on April 4, 1973, and several meetings have taken place.
4. A tentative unified Transportation Work Program has been drafted by DCPEDC and will be reviewed by the Joint Transportation Committee.

BUREAU OF TRANSPORTATION PLANNING & DEVELOPMENT

REGIONAL PLANNING AGENCIES - Region 12 Dukes County Cont.

The transportation problems encountered in the DCPEDC area are unique in that being an island with an enormous summer population, Martha's Vineyard is responsive to types of transportation unlike any other region in the Commonwealth.

A review of some of the items in the proposed work program, such as:

- a) Bicycles and bike paths.
- b) Sight-seeing buses.
- c) Steamship Authority.
- d) Beach vehicles (regulations).
- e) Motorcycles (regulations).
- f) Private Planes.
- g) Private Boats.
- h) Trucks and freight.

give an indication of the varied modes of transportation peculiar to this region, in addition to the normal passenger vehicles.

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENTHIGHWAY PLANNING UNITRural and Urban Inventory Program

The end of Fiscal 1973 approximates the completion of the fourth year of the Five-Year Update Schedule. The number of requests for inventory data, serviced during the year for public and private agencies and local communities, indicates the continued growth of the overall program in the areas of public acceptance and utilization of the product.

Worthy of note is the fact that we are starting to receive, at a somewhat steadier rate, the edited feedback of our printed data from district and local officials. This indicates that our past urgings for the completion of this necessary step in our program is starting to bear fruit. Much credit for this due the various District Planning Engineers.

During the year, field work was completed in Norfolk and Bristol Counties. With the exception of three communities, as of this report Plymouth County field work has also been completed. As soon as the work on these communities is completed, field work will be suspended in accordance with present plans. The field vehicles are in a sorry state for work of such an arduous nature. Field work will be reinstituted for Worcester, Barnstable, Dukes and Nantucket Counties, which is all that remains of the field work portion of the program, just as soon as the requested new equipment is received.

The list of programs making use of inventory data, e.g.

National Bridge Inspection Program, Federal-Aid Primary - Type II

HIGHWAY PLANNING UNIT - Rural and Urban Inventory Program Cont.

(TOPICS), Highway Classification and Needs, Highway Defense Bridge Record, Traffic Counting, Mapping, Urban Systems, etc., continues to grow and, at year's end, plans were being made to coordinate the data for use in the Department's photologging Project and for assistance to the Federal Railroad Administration on the National Grade Crossing Inventory and Numbering Project.

Traffic Volume Counting Program

The 1972 Traffic Volumes publication is being prepared. This publication contains Average Daily Traffic Volumes at approximately 3000 locations statewide. Included are all permanent, control and coverage stations taken in 1971 and 1972 as well as all special counts taken in 1972. A 1972 Flow Map is also being developed for publication.

During Fiscal 1973 approximately 3000 volume counts were taken at continuous, control and coverage stations. In addition, about 1000 special counts were taken at approximately 175 locations.

The program for the installation of magnetic loop detectors was continued for construction, reconstruction and maintenance projects. At present all control stations in District 1 are being converted to loops. All loops statewide are being checked for accuracy.

Vehicle Weight and Characteristics Study

The purpose of this annual study is to establish truck characteristics relative to magnitude, composition, axle weight, gross weights and commodities carried. The field data were obtained at fourteen

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENTHIGHWAY PLANNING UNIT - Vehicle Weight & Characteristics Study Cont.

locations throughout the State during July and August of 1972.

The data were processed and transmitted to the Federal Highway Administration for inclusion in the Highway Statistics Report.

The 1973 Truck Weight Study is in progress at 14 locations.

Interstate Traveled-Way Study

The data for the 1972 Traveled-Way Traffic Map were compiled and transmitted to the FHWA for inclusion in their National Map System of Interstate and Defense Highways.

Bridge Record - National Defense Highway System

The Bridge Record is completely revised and updated, and coded and is ready for keypunching.

This report shows the load carrying capabilities, horizontal and vertical clearances of all highway structures which may be used for large movements of military personnel, equipment and supplies or for civil defense purposes in or through the Commonwealth.

Classification and Needs StudyClassification:

The highway functional classification phase has focused on the updating of the 1968 classification to a "current" functional classification of roads and streets.

The development of these systems was done within the spirit of the 3C transportation planning process. Regional, district and community maps showing functional classification were prepared and presented to the Regional Planning Agencies and the districts, who

BUREAU OF TRANSPORTATION PLANNING & DEVELOPMENT

HIGHWAY PLANNING UNIT - Classification & Needs Study Cont.

in turn worked out procedures for the involvement and subsequent review by each local community.

The classification phase is a continuing effort and is being utilized as the basis for systems development on statewide, regional and local levels. The current classified systems may be used as a "tool" in the determination of revised Federal-Aid, State-Aid and administrative systems.

1974 National Transportation Study

Presentations of the 1974 NTS were made to each of the twelve (12) Regional Planning Agencies. The objectives of these presentations are to distribute information to the regions and also to receive input into the study, in order to obtain a comprehensive and cooperative program.

The major work effort has been in preparation of the functional classification, maps and reporting the required data on the physical state, performance and costs for the 1972 Transportation Inventory, 1990 Transportation Plans and the 1980 Transportation Program by urbanized areas, small urban area aggregates and rural areas.

1974 National Highway Needs Study

As required by the U. S. Department of Transportation and in response to Senate Joint Resolution 81, enacted in 1965, the Classification and Needs Study Group carried out the 1974 National Highway Needs Study. This study expanded upon the scope of the 1970-1990 highway needs study by including a progress report on satisfying the highway needs reported to Congress, an analysis of

HIGHWAY PLANNING UNIT - 1974 National Hwy Needs Study Cont.

highway needs by jurisdiction.

The data submittal forms required included information on 1990 functional classified mileages by known jurisdictions and reporting funding by functional system, improvement type and jurisdiction for urban and rural areas.

Traffic Forecasting and Analysis

During Fiscal 1973 the Traffic Forecasting and Analysis Unit received eighty-six (86) requests for traffic analysis and forecasts. This fiscal period saw the completion of eight-four (84) projects in the following categories:

1. Special Report

Interstate Cost Estimate

Traffic analysis and forecasts for the time frames of 1980, 1990, 2000 were developed for the following routes:

I-86	I-195
I-90	I-290
I-91	I-291
I-93	I-295
I-95	I-391
I-190	I-495
I-695	

Additionally, tables TF-2 (Link by link evaluations) and TF-3 (Urban Study Area Statistics), were completed

2. Route Analysis

Reports were made for 34 Route Analyses

3. Pavement Overlay Projects

Analyses were made for 10 Pavement Overlay Projects

BUREAU OF TRANSPORTATION PLANNING & DEVELOPMENT

HIGHWAY PLANNING UNIT - Traffice Forecasts and Analysis Cont.

4. Safety Projects

Route 9 Pittsfield - Dalton Avenue

5. Area Projects

Gardner - Chapel Street

6. Special Projects

East-West Corridor (Routes 2 & 9) Truck Usage

7. Environmental Impact Studies

Traffic Data was reported for 15 E.I.S. Projects

8. TOPICS Projects

22 TOPICS Projects were reported

BUREAU OF TRANSPORTATION PLANNING & DEVELOPMENT

FISCAL PLANNING

Fiscal Section

During the year a restructured Fiscal Section was established with the following subdivisions:

Data Collection and Reporting

Data Analysis

Fiscal Planning and Programming

The Data Collection and Reporting Unit is responsible for collection and tabulation of data and for the development of required Federal and State Reports (PR Forms etc.)

The Data Analysis Unit is responsible for developing studies of revenue generation and disbursement of transportation funds among cities and towns, counties, regions etc. on historic and future bases.

The Fiscal Planning and Programming Unit is responsible for developing revenue forecasts by classified systems to be integrated with identified needs and state, regional and local 3C priorities into programs for providing transportation facilities for various periods in the future. The initial duties of the unit are concerned with the 1980 program and the 1990 plan for the 1974 National Transportation Study.

Fiscal Section procedures and responsibilities are being developed in cooperation with an M.I.T. study group. Definitions of activities were well underway and implementation initiated by the end of the fiscal year.

BUREAU OF TRANSPORTATION PLANNING & DEVELOPMENTFISCAL PLANNING - Fiscal Section Cont.

The Fiscal Section completed its Final Rural and Urban Highway Mileage Analysis. The duty will be transferred to the Inventory Section to assure consistency of statistics.

Local Highway Finance Analysis

Work in 1973 included collecting and analyzing the receipts and disbursements for all highway purposes by the local government units in Massachusetts. The statistical report was prepared from data usually contained in Schedule A on the annual city and town financial reports as submitted to the Bureau of Accounts, Department of Corporation and Taxation.

The collection of the data represents a considerable effort in verifying and analyzing the accounts to fulfill the detailed categories of expenditures and receipts required by the Federal Highway Administration's "535" Report. In addition, data from each of the 351 cities and towns was assembled by groups according to population for Standard Metropolitan Statistical Areas and for counties.

This report also covers information relating to the Maurice J. Tobin (Toll Bridge of the Massachusetts Port Authority, the Callahan and Sumner Tunnels as well as the turnpike of the Massachusetts Turnpike Authority, and the public parking facilities of the Massachusetts Parking Authority.

INTER-AGENCY LIAISON

During the past year an inter-agency liaison unit was formed to assist the Bureau in coordinating its efforts with other state agencies in order to broaden the inter-disciplinary approach to planning being initiated by the Bureau. Contacts were established and cooperative efforts begun with Executive Office of Communities and Development - Department of Community Affairs, Executive Office Manpower Affairs-Department of Commerce and Development, Executive Office Environmental Affairs-Department of Natural Resources, and Executive Office Administration and Finance-Office of State Planning and Management. The Bureau is developing ties with Executive Office Manpower Affairs-Department of Commerce and Development to coordinate transportation and economic development plans and programs. Similar relationships will be established with other functional planning agencies.

A major part of the inter-agency liaison unit's efforts relate to participation on various inter-agency planning task forces. The unit assisted in the work of the (RMPC) Resource Management Policy Council's technical committee in developing a statewide land resource management program. It continues to participate in the State Water Quality Management Planning Program technical committee's work and the sub-state regions task force efforts to delineate logical sub-state areas for the administration of Federal and State programs. In addition, liaison

BUREAU OF TRANSPORTATION PLANNING & DEVELOPMENTINTER-AGENCY LIAISON

is maintained with SENE, Rural Development, bicentennial transportation planning and other statewide planning programs. The unit attends various meetings and conferences concerning land use, information systems, etc., to ensure the highest possible level of inter-agency cooperation.

The Inter-Agency Liaison Section has assumed the responsibility for providing inputs from other planning programs for Transportation Systems Planning.

Newsletter

During the last half of the program year a Newsletter was established by the Bureau in the Inter-Agency Liaison Section. It has a circulation of 1500 including the twelve regional planning agency commissions and their transportation advisory groups, district highway engineers, the Secretaries of state agencies, selectmen and state representatives, county commissioners and engineers and other interested state, regional and local public and private groups.

The initial issues were published in April and May 1973 and included articles concerning the 3C Planning Process, the Action Plan, the Berkshire Region, Statewide Airport System Planning and Franklin County.

BUREAU OF TRANSPORTATION PLANNING & DEVELOPMENT

INTER-AGENCY LIAISON

A-95 Review Procedure

The A-95 review procedure has been the direct responsibility of the Inter-Agency Liaison Section for the past year. There have been approximately 240 applications received and reviewed. There were about 40 applications reviewed that required qualifying statements in order to be acceptable to the Department. Five applications directly conflicted with our plans, programs and objectives. The remaining applications were acceptable to this Department as received.

Highway Corridor Land Use Committee Activities

The Highway Corridor Land Use Committee, established in February 1972, has been engaged in program development in the following areas:

1. Multi-use of rights-of-ways for trails and bikepaths consistent with a State-regional master plan.
2. Land Use controls adjacent to rights-of-way and at interchanges to insure transportation related development consistent with State, regional and local land use policies.
3. Protection and enhancement of scenic values in highway corridors including controls, easements, landscaping, and an appropriate scenic highway program.

BUREAU OF TRANSPORTATION PLANNING & DEVELOPMENTINTER-AGENCY LIAISON

4. Development of a rest area program consisten with trails and paths, corridor land use policy, and a scenic highway program.
5. Development of supportive standards, guidelines and legislation to implement prograns compatable with classified highway systems-rural and urban.

The following is a brief report on the status of the various elements of the program being developed by the committee assisted by inter-agency staff. Appropriate material has been collected from other States, Federal agencies, the regional planning agencies, private groups and the public agencies involved (Department of Public Works, Department of Natural Resources, Department of Community Affairs, Metropolitan District Commission, Boston Redevelopment Authority).

Trails and Bikepaths

The activities initiated by the Department of Public Works in February were formalized by Chapter 8 of the 1972 Resolves which provided for a study "relative to the development of a master plan and the financing of a system of bicycle paths and hiking trails". A report answering the resolve was submitted to the legislature on December 6. A definitive master plan could not be conceived in such a short period of time. The

INTER-AGENCY LIAISON

major recommendation was to continue the Joint Study of Bicycle Paths and hiking trails and to create a statewide master plan and implementation program. It also recommended the further investigation of funding sources and appropriate changes in legislation. The Board's findings were limited by the short time schedule. Four pilot bike path projects were recommended (1) Concord-Lexington to Boston Bicentennial Bikeway, (2) The Five College Area Bikepaths System in and around Amherst, (3) Dukes County System of Bikepaths, (4) Boston Common to Jamaica Pond Bikepaths Route (to be constructed by the Metropolitan District Commission).

In addition, two pilot footpath projects were contemplated: (1) Expansion of the Freedom Trail footpath, (2) a pedestrian footpath across the Charles River dam on the Warren Avenue alignment.

Progress on these projects has been made and preliminary standards and guidelines for bikepaths and hiking trails were formulated. They should be completed by the end of this year, as will the draft plans for the pilot projects.

The Bureau intends to develop plans and programs for bikepaths, scenic roads and rest areas within the State-Regional 3C relationship and according to the classification and needs process. Appropriate regional planning agency work program elements will cover these activities.

INTER-AGENCY LIAISONCorridor Land Use

It is intended to develop tentative policy recommendations for highway corridor land use based on study materials now being assembled. This element has not progressed to final stages because it must interface with the activities of the cabinet technical committee on land use. However, if it appears that general policy guidelines from that source will not be available in short-term, we hope to develop corridor standards, guidelines and recommendations at least for the major classified systems. Particular attention will be paid to land adjacent to (and within) rights of way and at interchanges on major systems. Obviously, such land use proposals can include scenic routes and should be consistent with current regional and local plans and objectives in specific situations. The next phase of this activity will be the analysis of available material and digest report thereon for review and other State and regional agencies.

Scenic Preservation and Enhancement

The inventory of this activity has started based on two detailed DPW documents: 1st the 1965 proposed Statewide System of Scenic Roads and Parkways and 2nd the 1966 Highway Beautification Cost Estimate. It is intended to ask DPW District Offices and the regional planning agencies to review both proposals to ascertain whether or not original projects remain appropriate.

INTER-AGENCY LIAISON

Following the review and update, it is intended to assign priorities to projects according to district, State and regional agency recommendations and to develop current cost figures and implementation proposals. A Scenic Roads Task Force has been formed by the Governor's Office to develop a program. Commissioner Barlow, member of the Scenic Roads Task Force, has been provided with a set of scenic route materials, divided by DPW districts, for the use of the new group. The Department's landscape design program also has been reviewed for consistency. It is intended that such activities be oriented toward implementation of whatever scenic highways or parkways plan develops.

Rest Areas

A draft statement and proposal regarding Information Services has been developed by the highway design section and submitted to the committee. Facilities to provide safe rest areas and encourage and guide tourism are proposed with State construction and private or Department of Commerce and Development operation. The committee will review the proposal earlier rest area plans and legislative recommendations. Any rest area plan should be related to trails systems, corridor land use, and scenic route plans for maximum utility and mutually supportive benefits.

Generally, it is intended to include the above activities in the 3C process by including them in the regional work programs being developed. All have inter-agency (State and regional) aspects.

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INTER-AGENCY LIAISON

A basic requirement is better intra and inter-agency communication at the State level to discourage the initiation of parallel efforts. Duplication has already hampered the activities in several areas,

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RESEARCH, TRAINING AND SPECIAL STUDIES

Examination of Non-Essential Properties and Right-of-Way of the Boston and Maine Railroad for Alternate Uses.

A contract was signed with Harbridge House, Inc. as consultant for a study to examine the non-essential properties and rights-of-way of the Boston and Maine Railroad for alternate uses, including highway-related uses and special purpose transport uses, and to estimate the costs and revenues of these uses.

Work on the contract began on May 3, 1973 and was completed on August 3, 1973.

Recommendations for alternate uses of abandoned Boston and Maine Railroad rights-of-way were made. The results of this study will be coordinated with other studies on the statewide railroad system .

Economic Impact Study - Routes I-91 and I-291 Springfield

The contract with consultant Worcester Polytechnic Institute to assess the social, environmental, physical, and economic benefits and/or detriments to an urban community in the impact area of an expressway after construction of a facility has continued through 1973. An extension of time from June 30, 1973 to December 31, 1973 was granted to the consultant to complete the study.

Monthly meetings of the Technical-Policy Advisory Committee have been held. Members on this committee include representatives

BUREAU OF TRANSPORTATION PLANNING & DEVELOPMENTRESEARCH, TRAINING AND SPECIAL STUDIES

of the Federal Highway Administration, the Massachusetts Department of Public Works, the City of Springfield, the Lower Pioneer Valley Regional Planning Commission, the Springfield Chamber of Commerce, the Springfield Press, the Massachusetts Department of Commerce and Development, and the Massachusetts Department of Community Affairs. This committee has functioned in an advisory capacity in the establishment of overall policy for the study, in the review and evaluation of methodology and findings and the dissemination of information..

Data on economic, social, environmental and community impacts have been collected

Nationwide Truck Commodity Flow Study

As a continuation of Goods Movement research, the Bureau of Transportation Planning and Development has continued to assist the Federal Highway Administration in a Nationwide Truck Commodity Flow Study.

The Bureau initiated a monthly search of Registry of Motor Vehicles truck registrations to select a predetermined sample of trucks to answer a comprehensive questionnaire on truck movements, weights, cargoes and trips for a specific 24-hour period.

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This program selected approximately 1000 truck units each month for the period of July, 1972 to July, 1973, and forwarded the data to the Federal Highway Administration for analysis on a nationwide basis.

The response from truck owners has been satisfactory.

In-House Training Course

During the year, several new transportation planning engineers have been appointed in various districts of the Department of Public Works. Also there has been the assignment of engineers with little transportation planning experience to planning and liaison work for the urbanized areas and with the regional planning agencies. This pointed to a definite need for an in-house course.

Monthly sessions have been held for general orientation concerning the transportation planning process. It is anticipated that as time goes on, a more technical approach in the training will be achieved. It is proposed that a number of the personnel can be sent to the FHWA Urban Transportation School in Washington, D.C.

In January, the Urban Planning Division of the office of Highway Planning, Federal Highway Administration conducted a one week presentation on Urban Transportation Planning Course. This course was attended by over sixty (60) people from Federal, State, Regional and local agencies and for many was their first experience with the purpose and scope of transportation planning.

BUREAU OF TRANSPORTATION PLANNING & DEVELOPMENTRESEARCH, TRAINING AND SPECIAL STUDIESStatewide Airport System Study

Massachusetts became the first state in the country to initiate an Airport System Study under funding provided by the 1970 Airport and Airways Act of Congress.

This year, the Bureau of Transportation Planning and Development in cooperation with the Massachusetts Aeronautics Commission, and with A.D. Little as consultant, has prepared a Preliminary Plan for the role of 39 airports in the state general aviation system.

The Bureau has contributed the land use inventory, the layout maps and the structural and capacity analysis of highway facilities serving these airports. Others have evaluated the navigational, safety and operation capacity resources of the system. At this stage of the study, recommendations have emerged and a series of public meetings in the Regional Planning Process have been held to inform, and listen to local and regional citizens on this program. Their comments have been incorporated into the final report.

Employee Commuter Studies

Efforts to reduce peak hour congestion generally and parking demand specifically at 100 Nashua Street may result in the findings of the 1972 origin-destination and attitude survey of 900 plus DPW employees and 700 plus Registry of Motor Vehicles employees based in the North Station area.

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Findings show that employee parking demand is almost double the capacity of parking space, and that employees are receptive to other modes such as express buses from outlying stations, car parking and shifting to transit under certain conditions. Starting hour of work and even 4-day work weeks were listed by employees as means of reducing travel congestion. Comparison with a similar study during 1970 indicate a very slight but identifiable shift to transit use by Department and Registry employees. A program of car-pooling with reserved parking has begun at 100 Nashua Street.

The Bureau has made recommendation for DPW feeder service from the Riverside Line MBTA to the Wellesley Maintenance Depot for employees who have no cars or cannot participate in car-pools. The fact that an employee at Wellesley Depot must commute by car is limiting condition to such employment. Estimates of cost of such service have been made to establish feasibility of recommended service. This program has been instituted. Car-pooling by Department employees in the various districts is being considered.

Development of Massachusetts Action Plan

The Federal Highway Act of 1970 included Section 109H which required every State Highway Department to consider the social, economic, and environmental impacts that highway improvements might impose and document the procedure in a so-called "Action Plan"

In view of this Act the Federal Highway Administration drew up guidelines PPM 90-4 for the states to follow relative to this matter.

RESEARCH TRAINING AND SPECIAL STUDIES

Late in December of 1972 the Commissioner of Public Works assigned key personnel of the Department to draw up a Massachusetts Action Plan in compliance with Federal PPM 90-4.

The key personnel consisted of two groups, a supervisory group called the Task Force, and a working group called the Action Plan Group. Both groups were comprised of personnel from various disciplines in the Department to allow for balanced thought in the development of the Action Plan.

It was the duty of the Action Plan Group to establish communication with sister agencies, regional planning agencies, interest groups, and private citizens during the development procedure. To satisfy this requirement of PPM 90-4, the Action Plan Group prepared and distributed brochures and letters explaining the Action Plan; on Departmental procedure; prepared and had published in the state's twenty three larger newspapers questionnaires pertaining to the development of the Action Plan, prepared and distributed a flow diagram and critique of the existing process for review and comment; and continuously worked to prepare a first draft of the Action Plan to be made available for distribution in late July, 1973.

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENTINFORMATION SYSTEMSFederal-Aid SystemsCoordination of Federal-aid Routes at State Lines

After the completion of coordination of Federal-aid routes with the States of New Hampshire and Rhode Island in fiscal 1972, an attempt was made to coordinate these routes with Connecticut. Due to the unwillingness of district and local level people to agree on a Connecticut proposal affecting FAP route 128 in Hampden Mass, coordination slowed and was temporarily discontinued due to the press of urban area submissions.

Urban Systems

Regarding the number of communities that have not signed the urban systems maps; there is no change, since this figure remains at 3.

Urban Systems route 7652 in Springfield was submitted to and approved by the Federal highway administration.

For more than a year the city of Quincy has been working on a proposal to obtain one new urban systems route designation.

A submission was prepared by the mapping section for the original proposal to the Federal Highway Administration for approval. The City of Quincy declined signature having decided to change the alignment and asked for a meeting with Planning.

The mapping section made suggestions on procedure for submitting system changes to FHWA. Meetings on procedure were held in the Planning section.

INFORMATION SYSTEMS - Federal-Aid Systems - Urban Systems Cont.

Recently the Bureau of Project Development has informed the city that "at this time all requests for changes or additions to the Urban System are temporarily being held, pending the 1973 Highway Act relative to the funding for the Department.

Other Federal-aid Routes

FAS Route 303 extension through Buzzards Bay - Bourne was submitted to and approved by the Federal Highway Administration.

The Discontinuance of FAP Route 56 along existing route I-86, in part, was submitted to and approved by FHWA.

The Discontinuance of most of route I-395 and the transfer of mileage to route I-190 (Worcester to Leominster) was submitted to and approved by FHWA. Since this action is the key toward accelerating to completion the construction of a north south highway in Central Mass. which otherwise would have required many years under State funding, Commissioner Campbell commended all who took part in the preparation of the lengthy report which requested approval by FHWA.

Since proposed I-190 alignment (originally State Route 52) was also FAP route 4, in part, it was requested of and approved by FHWA that FAP route 4 be returned to state route 12 alignment in this area.

Urban Areas

The remaining urban area submissions to and approvals by FHWA have been completed based on the 1970 decennial census. A book of urban area maps Volume I "Urban Area Partials" and a book of urban

INFORMATION SYSTEMS - Federal-Aid Systems - Urban Areas Cont.

area descriptions "Urban Area Narrative Descriptions" - Volume 2 have been printed, collated, and distributed.

A single sheet map of Massachusetts showing the location of urban areas has been produced and prints are available.

Type II System for TOPICS

Distribution of Area-wide TOPICS Type II System approvals to various planning units continues.

Mapping

Federal-aid Route Maps

Changes in Federal-aid routes were posted on the Federal-aid route mylars as they were approved by FHWA.

Update of General Highway Maps

Some progress has been made toward the eventual production of an updated (General Highway Map), - a series of maps covering the state.

The apparent consensus is that a new base map (maps) will carry approximately the same sort of data as the old and will cover the state on a regional basis; also that there will be maps of urban areas, possibly 2000' - 1"; There is a definite need for a book of maps that can be opened by a front seat automobile passenger.

The contract with Lockwood Kessler & Bartlett to supply 9" X 9" 1:40,000 Scale aerial photos has not been completed although photos for approximately the eastern 1/3 of the state have been delivered.

INFORMATION SYSTEMS - Mapping Cont.Urban Systems Maps

The mapping section received the Urban Systems Mylars from the Urban Design section at 100 Nashua St. on August 22, 1972. The Mapping Section is keeping these mylars up to date, and making distribution of copies.

Traffic Flow Map

A traffic flow mylar for 1971 was produced and is available upon application. Figures include estimates based on data of prior years.

Regional Maps

A regional mylar for the Cape Cod Region was produced.

Maps sales for fiscal 1973 have amounted to \$934.00. An inventory made July 13, 1973 indicates that approximately 10,000 of the 1" = 5,280' smaller maps, have been used since June 20, 1972 which has resulted in a request by the mapping section to the Director to halt the sales of assembled sheets in groups of 99.

UNITED STATES CENSUS DATA

The printouts for preparing equivalence tables between the census unit areas and the traffic zones were received from the Census Bureau. Work has begun on transferring the equivalence data to the printouts for transmittal to the Census Bureau. Several requests have already been received for the data. The equivalence tables will be submitted to Washington for the areas with the highest priority. Changes in the procedure will enable

UNITED STATES CENSUS DATA Cont.

us to get the data for areas of greatest need first. In addition to the normal output of the package we will be receiving a town to town matrix of work trips for all 351 municipalities in the state.

A seminar on the Urban Transportation Package was sponsored by the Department. It was attended by representatives from transportation agencies in the surrounding states and regional and other state agencies. Led by Census Bureau personnel it was a very successful seminar. In the presentation plus conversations after the seminar clarifications were provided on a number of questions on the package.

SYSTEMS DEVELOPMENT

In developing a Planning Information System, this section has done considerable investigatory and development work this year including the following:

1. Extensive contact with several adjacent states regarding their information systems bases.
2. Met with New Hampshire to seek agreement in the development of common identification systems and Census DIMES files usage.
3. Sent four staff members to the Census Use Conference in Wakefield to study further applications of Census DIMES files in Transportation.
4. Began coding a pilot project in an attempt to interface

BUREAU OF TRANSPORTATION PLANNING & DEVELOPMENTSYSTEMS DEVELOPMENT Cont.

DIMS files with our Road Inventory System.

5. Began development of standard Documentation procedures.

DATA RETRIEVAL

In addition the section performed its usual service functions of running computer edits updates, and reports on street files, road inventory data, bridge inventory data, railroad inventory data, mailing labels, etc.

PLANNING APPLICATIONS

The Planning Applications Unit has the responsibility for advising and assisting other Units in the planning process at the comprehensive, project, and functional levels.

During the past year we have been called upon to perform the following types of tasks.

1. Provide computer assignment forecast volumes to various projects, such as: Berkley - Dighton Bridge, Rte. 25-140, Rte 1A - Beverly, Salem Bridge, Rte. I-191 - Holyoke, Chicopee - W. Springfield Bridge, Rte 2 in Concord Lincoln, etc. This is a typical list but by no means exhaustive.
2. All networks in all urban areas have been upgraded.
3. Conducted a course in "Network Technology" for the District Planning Engineers.
4. Provided network displays to various liaison personnel at their request.

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5. Performed summaries of base year data for other units as requested.
6. Perform intra-office liaison on technical matters, advising other units of methods available for use and programs that would aide their work effort.
7. Provide data to non-D.P.W. groups as authorized, such as: T.S.C., M.I.T., Northeastern, Harvard, etc, as well as numerous consultants to the Department.

LIBRARY

This year, the Bureau has assumed responsibility for the Department Library. Plans are being developed to consolidate this library with our own, in larger quarters, and with a more sophisticated level of service. These changes will make the Transportation Library a much more effective tool for all who are concerned with Transportation.

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

ADMINISTRATION

Recently an Administration Services Unit was added to the Bureau. This unit is responsible for co-ordinating contracts, preparing budgets and Bureau fiscal reports and expediting the flow of correspondence between the Bureau and various outside agencies. In addition, all internal records, requisitions, progress reports, equipment reports, repairs, etc. are co-ordinated through the administrative unit. This work was formerly performed by the individual sections of the Bureau, and it is expected that the establishment of this unit will result in a smoother functioning of many of the Bureaus responsibilities.

E

BUREAU OF PROJECT DEVELOPMENT

The Bureau of Project Development was created in October 1972. It includes the Location and Survey Section, Environmental Section and Special Projects Section.

The Project Development process is one of narrowing down options to produce a single alternative alignment for a highway. Actually the work of highway departments has shifted dramatically in recent years. Today highway projects often go where there never has been a road or through highly urbanized areas, and find it increasingly difficult to avoid encountering housing developments, parks, historic sites, wetlands and scenic views.

The demand and command to build a "balanced transportation" system is also a top priority in the newly formed Bureau. Under existing legislation the department is neither authorized nor presently funded to perform detailed studies of other forms or modes of transportation in the Project Development process, but it is willing and available to participate in joint development studies and designs with those agencies funded to do so. Not too long ago, measures to soften the environmental impact of highways were often seen by the public as extravagant frills. Now the public pressures for funds to be spent in this direction.

The highway official, State and local, has long been aware of the potential impact of his work. To build a road, one must fell the tree, lower the hill, bridge the river. Highway experts have sought to soften these impacts-experimenting with planning techniques and improving construction methods.

In response to public demand, Congress has enacted a series of

BUREAU OF PROJECT DEVELOPMENT

requirements and authorizations to help the highway administrator protect the environment:

- * The 1950 Federal-Aid Highway Act created public hearing requirements.
- * In 1962, legislation called for greater participation by local officials, and coordination of urban transportation plans with an area's comprehensive plan.
- * In 1966, Section 4(f) of the Department of Transportation Act called for special efforts to avoid taking land from parks, wildlife refuges, and historic sites.
- * The landmark National Environmental Policy Act of 1969 required: that a written evaluation of the environmental impacts of each significant project be circulated to other agencies and the public; that project development include a multi-disciplinary approach; and that alternate plans be developed.
- * The Federal-Aid Highway Act of 1970 contained Section 136(b), designed to make sure that each State would fully consider the impacts of any and all proposals for highways within that State.

In 1972 the state enacted its own Environmental Protection Act which covers all non-federal aid projects.

An outline of the steps required for project development are as follows:

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(For a highway project on new location where land takings and relocation are required)

1. To begin with, a transportation project is considered worthy of study, and so recommended through a regional planning agency; legislative action, etc.
2. The Department of Public Works makes a decision to embark on a feasibility study, which will include an environmental impact evaluation; because of the magnitude of the project and the current workload, a consulting engineering and/or environmental firm is recommended.
3. A scope of work is prepared, a consultant firm is selected, a contract negotiated and Administration and Finance and Federal Highway Administration approval is obtained.
4. Department furnishes survey plans to consultant, usually through aerial photogrammetry. This requires a separate contract with an aerial survey firm.

The Bureau has been involved in other highway related projects such as:

1. Joint development of Massachusetts Bay Transit Authority stations with parking and highway access.
2. The study of alternate uses of Railroad Right-of-Way.
3. Studies with municipalities for the joint development and scenic enhancement of land adjacent to new highways.
4. Miscellaneous projects
 - A. Fringe Parking along Route 129

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B. Boston Parking Program

C. Depressed Central Artery

The Environmental Section of the Bureau of Project Development during the fiscal year 1973 supervised the development of 42 active contracts for major Environmental Impact Statements. Negotiations for 39 other Environmental Impact Statements were completed and contracts for these projects are being processed. Two statements were developed to the Preliminary Draft stage on-house and will be circulated during fiscal 1974. Seven Draft E.I.S.s were circulated for comment and review and one Final Statement was forwarded for approval.

The major projects for which statements were circulated were for 15 miles of Interstate 190 and 17 miles of Interstate 95. The environmental statement development cost for these two projects exceeds \$650,000. and represents a potential construction cost total exceeding 110 million dollars.

Approximately 65 negative declarations for relative minor projects including all Topics projects were reviewed by the Environmental Section.

The Environmental Section of the Bureau of Project Development during fiscal year 1973 developed guidelines for the Department's compliance with the Mass. Environmental Protection Act (ch. 30, sec. 61 & 62 of the MGL). This involved meeting with representatives of the EOTC and the Executive Office of Environmental Affairs, as well as many staff meetings and interviews within the Department. The Environmental Section has submitted information to the Executive Office of Transportation & Construction as a primary input for the drafting of regulations for compliance with this new law; and is currently

BUREAU OF PROJECT DEVELOPMENT

meeting with Department personnel in Boston and in the Districts to implement these regulations.

Environmental Section personnel have also represented the Department at several Wetlands Hearings with local Conservation Commissions as required by Ch. 131, Sec. 40 of the MGL to insure that the Department has complied with all Environmental Laws and to act as a liaison for the exchange of information.

Geodetic Survey

Field Work

Triangulation	8 Sq. Miles
Second Order Traverse	123 Miles
Second Order Levels	60 Miles
Astronomic Azimuths	7
Total Monuments Recovered (of which 200 are Tidal Bench Marks)	1,408
Total Monuments reported destroyed	172
New Monuments Set	245

Office Computations

Traverse	88 Miles
Levels	42 Miles
Geographic Positions Computed	4,000
Translation of State House Coordinates To Geographic Position for Logan Airport	50

Office Maintenance

New Control Cards typed, drafted and filed	245
Old Control Cards, Updated	1,408
New Control Sheets Plotted	3,025 Sq. Miles

BUREAU OF PROJECT DEVELOPMENT

Geodetic Survey (Cont'd)

Office Service

Requests for Survey Control By Phone, Mail, or Walk-in	1,000
Requests for other Survey information and/or advice	300

Comment

The maintenance of a survey net in excess of 20,000 monuments over 8,000 square miles would be impossible without the assistance and cooperation of surveyors, public and private, outside of the State Service.

The Massachusetts Geodetic Survey Section takes this opportunity to thank them in this public record.

F

The major functional activities of the Division of Administrative Services (approximately 324 employees) are as follows:

1. Processing, reviewing, recording and reporting all financial transactions of the Department.
2. Processing and recording of all personnel actions.
3. Coordinating the preparation and administration of the Department budget.
4. General Services (Print Shop, Blue Print Shop, Micro-filming, Photography, Xeroxing, Mail Room and other general services to the Department.
5. Establishing and revising administrative procedures and systems.
6. Accident prevention and safety programs.
7. General secretarial activities for the Department.
8. Supervision of:
 - a. Public Works Building Security.
 - b. Public Works Building Operation and Maintenance.
 - c. Motor Pool Activities.

Appendix A. presents organization chart and statement of responsibility for the Division and the sections thereof.

During Fiscal 1973, the Division continued its long-range effort to strengthen and streamline all functional operations, particularly in the general administrative and financial management areas.

APPENDIX A

Organization Chart

Statement of Responsibility

DIVISION OF ADMINISTRATIVE SERVICES

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS
STANDARD OPERATING PROCEDURES

S.O.P. No. ADM-01-35-1-000

PAGE 1 OF 1

SUBJECT
DIVISION OF ADMINISTRATIVE SERVICES - ORGANIZATION CHART

DISTRIBUTION
A

EFFECTIVE

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SUPERSEDES

PAGE 1 OF 1

APPROVED

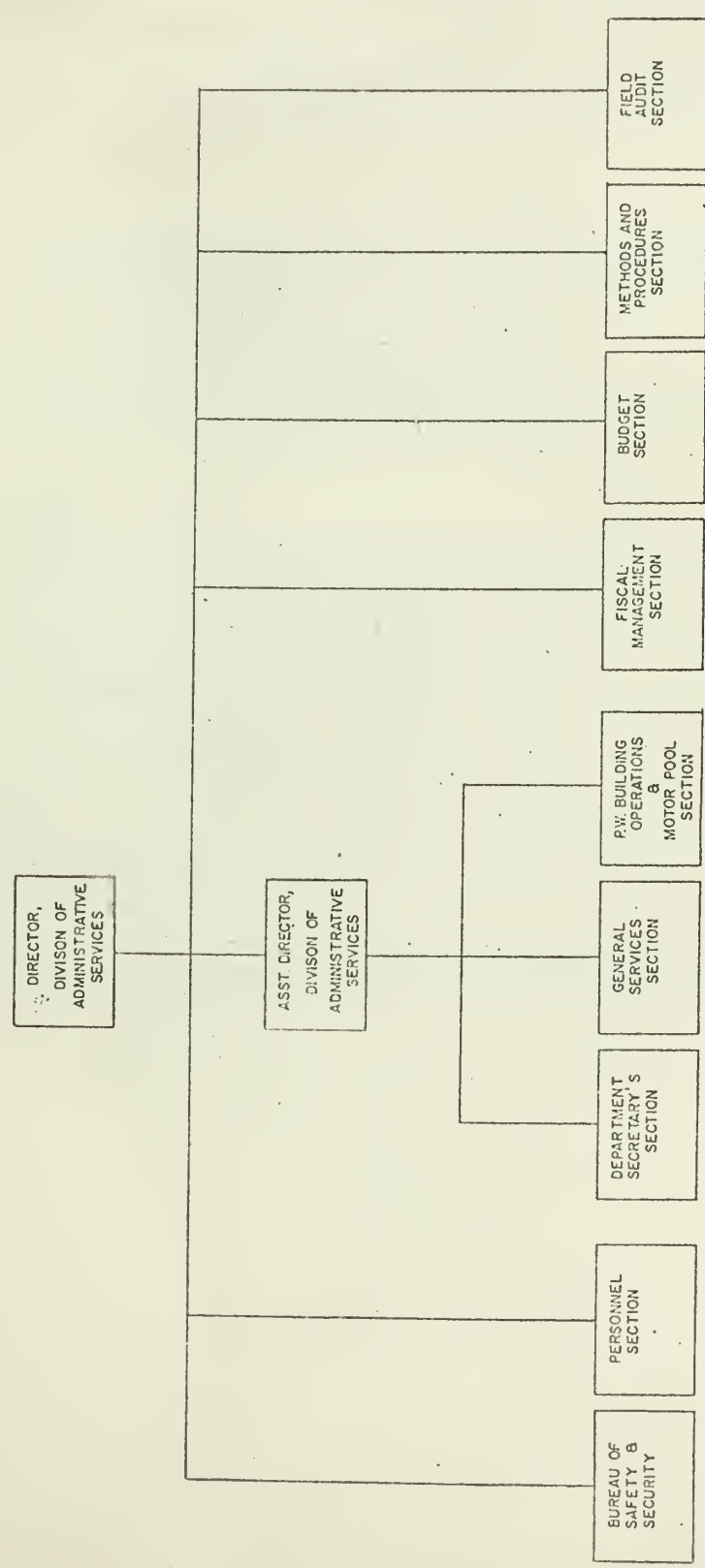
May 21, 1972

Sep. 27, 1972

S.O.P. No. ADM-01-35-1-000

EFFECTIVE March 15, 1969

Prince Campbell



COMMONWEALTH OF MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS STANDARD OPERATING PROCEDURES			S.O.P. No. ADM-01-36-1-000
			PAGE 1 OF 1
SUBJECT DIVISION OF ADMINISTRATIVE SERVICES STATEMENT OF RESPONSIBILITIES			DISTRIBUTION A
EFFECTIVE May 21, 1972	ISSUED Sept. 27, 1972	SUPERSEDES SOP No. ADM-01-36-1-000 EFFECTIVE March 15, 1969	PAGE 1 OF 1 APPROVED <i>Bonnie Campbell</i>

SUMMARY STATEMENT OF RESPONSIBILITIES

Responsible for the administrative and financial activities of the Department.

MAJOR ACTIVITIES

1. Processing, reviewing, recording and reporting all financial transactions of the Department.
2. Processing and recording all personnel actions.
3. Coordinating the preparation and administration of the Department budget.
4. General Services
5. Establishing and revising administrative procedures and systems.
6. Accident prevention and safety programs.
7. Public Works Building Security
8. General secretarial activities
9. Supervision of:
 - a. Public Works Building Operation and Maintenance
 - b. Motor Pool Activities.
10. Auditing of utility company, railroad and consultant contract billings to ascertain their correctness and propriety.

G

DIVISION OF WATERWAYS

The Division of Waterways as most recently reorganized under Chapter 821 of the Acts of 1963 is a separate Division within the Department of Public Works. Its duties and functions are separate from the so-called Highway Division of the Department and are outlined in Chapter 91 of the General Laws. In addition to the duties and functions as outlined in Chapter 91 of the General Laws, the legislature by means of special legislative acts and resolves authorizes and directs the department of public works through its division of waterways to perform functions that are beyond the scope of Chapter 91.

A list of the chief functions and responsibilities of the Division of Waterways follows:

UNDER CHAPTER 91

1. The design and supervision of construction of shore protection, harbor improvement and development, stream clearance and flood control projects throughout the Commonwealth. Design is performed either with the Division's own staff or by consulting engineers. Supervision of construction is with our own staff.
2. Issues licenses for structures in certain rivers, tide-waters and great ponds; and permits for dredging. All licenses and permits are issued after a public hearing has been held.
3. Makes field inspections to see that work for which licenses or permits have been granted comply with plans.

DIVISION OF WATERWAYS

UNDER CHAPTER 91 (Cont'd)

4. In charge of great ponds (over 1300), Commonwealth tide lands, rights in land, flats, shore and tidewaters (over 1900 miles of tidal shore).
5. Acts as the coordinating agency for Federal harbor development and shore protection projects done on a co-operative basis (i.e.; in some cases only fiscal co-operation and in other cases both fiscal and engineering cooperation).
6. In charge of the State Piers at Plymouth and New Bedford and Pilgrim Memorial Park in Plymouth (Plymouth Rock and surrounding area).
7. Leases Fall River and Gloucester State Piers. Makes certain repairs and reconstruction to said piers as authorized by Special legislation.

UNDER SPECIAL LEGISLATION

1. Acts as the contracting agent for the Public Access Board. As such represents the Commissioner of Public Works at meetings of the Board. Designs and supervises construction of public boat launching sites approved by the Public Access Board.
2. Acts as the contracting agent for the Department of Natural Resources for the design and construction of recreational facilities such as swimming pools and skating rinks outside the Metropolitan District Commission.

DIVISION OF WATERWAYS

UNDER SPECIAL LEGISLATION (Cont'd)

3. Under Chapter 595 of the Acts of 1970, the duties of the County Commissioners relative to the construction, supervision and maintenance of dams and reservoirs were transferred to the Commissioner of Public Works, who has assigned the duties to the Division of Waterways. The Division is receiving assistance from the Highway Districts, who have assigned personnel to make inspections and prepare reports.
4. The Division in cooperation with the Massachusetts Port Authority; the U. S. Coast Guard; U. S. Army Corps of Engineers; the Mass. Department of Public Health; the Attorney General's Office; and the Boston Harbor Committee on Pollution, is preparing a program aimed toward cleaning up navigational, health, and safety hazards in Boston Harbor and other coastal waters.
5. Under Chapter 870 of the Acts of 1970, a special fund was created to be known as the "the Harbors and Inland Waters Maintenance Fund."

The work to be done from the monies in this fund consists of the continuous maintenance, dredging, and cleaning of the harbors, inland waters and great ponds of the Commonwealth in order to protect the wetlands of the Commonwealth.

DIVISION OF WATERWAYS

UNDER SPECIAL LEGISLATION (Cont'd)

6. The Division of Waterways is the representative for the Commissioner on the following commissions and boards:

1. Water Resources Commission meets Monthly
2. Public Access Board meets Monthly
3. Connecticut River Flood Control
Commission meets Quarterly
4. Thames River Flood Control
Commission meets Bi-Annual
5. Merrimac River Flood Control
Commission meets Bi-Annual

DIVISION OF WATERWAYS

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CONSTRUCTION PROJECTS COMPLETED July 1, 1972 to June 30, 1973

<u>CONT.</u> <u>NO.</u>	<u>LOCATION</u>	<u>TYPE OF WORK</u>	<u>CONTRACTOR</u>	<u>COST</u>
118B	Attleborough	Swimming Pool	John H. Fellouris Inc.	\$ 346,809.22
71PA	Boston	Access Ramp	Spiniello Constr. Corp.	144,882.25
73PA	Brewster	Access Ramp	Lawrence-Lynch Corp.	32,722.25
119B	Brockton	Swimming Pool	Rich Constr. Co.	412,387.03
120B	Chicopee	Swimming Pool	T.D. Daley & Sons	428,166.10
272B	Clinton	Brook Study	Metcalf & Eddy	25,000.00
130B	Fall River	Skating Rink	Alrae Constr. Co. Inc.	1,184,501.06
121B	Fall River	Swimming Pool	John H. Fellouris Inc.	424,962.00
2757	Falmouth	Dredging	Hydro-Dredge Corp.	73,625.64
131B	Franklin	Skating Rink	J.A. Sullivan Corp.	1,113,027.82
2760	Gloucester	Wreck Removal	Ocean Salvage Inc.	16,250.00
132B	Holyoke	Skating Rink	D.A. Sullivan	1,155,633.15
2652	Ipswich	Brook Improvements	G. Rotondi & Sons, Inc.	70,994.00
122B	Lawrence	Swimming Pool	L.C. Cyr	388,538.30
136B	Leominster	Swimming Pool	Leominster Engr.	388,127.78
124B	Lowell	Swimming Pool	Salem Engr.	391,743.70
140B	Lowell	Skating Rink	D. Libero Constr. Co.	1,043,000.00
2741	Manchester	Stream Impr.	T.F. Kiley Constr. Co.	45,267.80
2758	Manchester	Harbor Dredging	Hydro-Dredge Corp.	105,340.00
114B	Marlboro	Skating Rink	J.A. Sullivan Corp.	1,141,081.94
2738	Monterey	Dam	Petricca Constr. Co.	335,358.00
141B	Newburyport	Skating Rink	D. Antonellis Inc.	1,064,500.00
2719	Newton	Brook Imp.	R.A. Buccella & Sons	246,770.80
135B	North Adams	Skating Rink	Petricca Constr.	42,146.60
2693	No. Attleborough	Dam & Access Facil.	T&T Construction	217,208.65
2766	Norwood	Channel Impr.	Ernest Minelli	9,030.80
2717	Orleans	Bulkhead	Hydro-Dredge Corp.	120,952.90
133B	Plymouth	Skating Rink	D. Antonellis Inc.	1,092,318.00
2723	Plymouth	Town Wharf	H.W. Klang & Son	17,158.37
2718	Quincy	Seawall Constr.	Ernest Minelli	72,667.00
2729	Quincy	Shore Protection	D.F. Frangioso & Co.	145,931.75
2751	Sandwich	Beach Groins	Gracia Bros.	52,990.44
77PA	Shrewsbury	Parking Area	Wenley-Lundgren Co.	7,679.15
125B	Southbridge	Swimming Pool	A. Mason & Sons	345,921.13
143	Springfield	Skating Rink	J.A. Sullivan Corp.	21,150.00
117B	Taunton	Skating Rink	D. Antonellis Inc.	1,106,500.00
2761	Tisbury	Dredging	Hydro-Dredge Corp.	71,782.89
70PA	Wareham	Public Access	Wenley-Lundgren Co.	82,055.98
2731	Winthrop	Lewis Lake	Bonacorso Constr. Co.	55,564.15
2754	Winthrop	Dredging	Hydro-Dredge Corp.	95,080.76
72PA	Winthrop	Harbor Access	State St. Engr. Corp. Whittier Equipt. Corp.	82,736.48

41 Projects Completed

Total

\$14,173,563.89

DIVISION OF WATERWAYSCONSTRUCTION CONTRACTS AWARDED- July 1, 1972 to June 30, 1973

<u>CONTRACT Number</u>	<u>LOCATION</u>	<u>TYPE OF WORK</u>	<u>CONTRACTOR</u>	<u>COST</u>
145-B	Agawam	Swimming Pool	E. J. Pinney	\$338,100.00
118-B	Attleboro	Swimming Pool	John Fellouris	346,809.22
139-B	Auburn	Skating Rink	J.A. Sullivan Corp.	1,189,000.00
2768	Barnstable	W. Bay Jetty Ext.	Hydro Dredge	11000.00
2774	Boston	Removal of Sunken Autos	Frank Ganter Co.	2800.00
73PA	Brewster	Access Ramp	Lawrence Lynch Co.	32,722.25
142B	Brockton	Skating Rink	J.A. Sullivan Corp.	87,000.00
2750	Chatham	Shore Protection	Ernest Minelli Inc.	6,480.00
74PA	Danvers	Access Ramp	O. Menici and Sons Inc.	98,455.00
2764	Dedham	Lowder Brook	D'Alessandro & Sons Corp.	64,543.00
2735	Dedham	Wigwam Brook	G. Bonazolli & Sons	77,192.00
2747	Eastham-Crleans	Rock Hbr-Jetty	Gracia Bros.	26,686.00
2757	Falmouth	Great Pond	Hydro Dredge	73,625.64
148B	Gardner	Skating Rink	J.A. Sullivan	1,038,979.00
2760	Gloucester	Wreck Removal	Ocean Salvage Inc.	16,250.00
2765	Harwich	Dredging	Hydro Dredge	46,180.00
2763	Hingham	Revetment	Joseph J. Gratta	39,000.00
2652	Ipswich	Farley Brook	G. Rotondi & Sons	70,994.00
2758	Manchester	Dredging	Hydro Dredge	1,155,000.00
2771	Manchester	Seawall	Dan C. Marino Inc.	34,985.00
75PA	Merrimac	Boat Access Facilities	Emil J. Incollingo Inc.	13,293.80
2766	Norwood	Channel Improvements	Ernest Minelli Jr.	100,500.00
77PA	Shrewsbury	Parking Area	Henley-Lundgren Co.	7,672.50
143B	Springfield	Skating Rink	J.A. Sullivan Corp.	87,000.00
2761	Tisbury	Dredging	Hydro Dredge	71,782.89
2731	Winthrop	Lewis Lake	Bonaccorso Constr. Co.	45,412.50
144B	Worcester	Skating Rink	J.A. Sullivan Corp.	87,000.00
27 PROJECTS			TOTAL COST	\$4,038,512.80

DIVISION OF WATERWAYSPROJECTS UNDER CONSTRUCTION AS OF JUNE 30, 1973

<u>CONTRACT NO.</u>	<u>LOCATION</u>	<u>TYPE OF WORK</u>	<u>CONTRACTOR</u>	<u>EST. COST</u>
145 B	Agawam	Swimming Pool	E. J. Pinney	\$ 338,100.00
2768	Barnstable	Jetty	Hydro-Dredge	\$ 13,176.00
74PA	Danvers	Access Ramp	O. Menici & Sons	105,000.00
2750	Chatham	Shore Protection	Ernest Minelli	6,480.00
2764	Dedham	Lowder Brook	A. D'Alessandro & Sons	64,500.00
2747	Eastham	Jetty	Gracia Bros.	23,000.00
2765	Harwich	Dredging	Hydro-Dredge Corp.	46,000.00
2763	Hingham	Stone Mound Revetment	Joseph J. Gratta	44,000.00
2771	Manchester	Sea Wall	Dan C. Marino	35,000.00
75PA	Merrimac	Access Ramp and Road	Emil J. Incollingo Inc.	14,100.00
2737	Peabody	Strongwater Brook	T & T Constr. Co.	118,000.00
109B	Sandwich	Scusset Beach	Henley-Lundgren Co.	758,000.00

12 PROJECTS UNDER CONSTRUCTION

TOTAL	1,565,356.00
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DIVISION OF WATERWAYSPROJECTS UNDER DESIGN OR IN PROCESS AS OF JUNE 30, 1973

<u>CONTRACT</u> <u>Number</u>	<u>LOCATION</u>	<u>TYPE OF WORK</u>	<u>EST. COST</u>	<u>REMARKS</u>
2769	Chatham	Beach Study		Design 100%
	Chilmark	Shore Protection	20,000.00	Design Pending
	Danvers	Stream Impr.	105,000.00	Design 10%
2770	Dennis	Reconstruction & Sand Fill	70,000.00	Design 90%
	Everett	Barge Removal	25,000.00	Chapter 878
2773	Falmouth	Dredging & Jetty	70,000.00	Design 50%
2699	Fairhaven	Union Wharf Study	8,000.00	
	Falmouth	Shore Protection	70,000.00	Design 70%
	Fall River	Battleship Cove Bulkhead	1,800,000.00	Waiting Decision by City
2748	Fall River	Roof Repair	35,000.00	Design 50%
	Hingham	Dredging Study		Study Underway
	Hadley	Access Ramp	100,000.00	Design 20%
	Hatfield	Access Ramp	65,000.00	
2759	Marblehead	Wharf	37,000.00	Design 30%
147B	Methuen	Swimming Pool	375,000.00	Design Pending
	Middleborough	Memasket River	20,000.00	Design 60%
2703	Milford	Dam (Lake Louisa)	475,000.00	Design 100%
76PA	Monterey	Access Ramp	50,000.00	Design 8%
2693	North Adams	Gallup St. Brook Impr.	35,000.00	Waterways Survey
	Northfield	Access Ramp	90,000.00	
	Newburyport	Access Ramp	65,000.00	
2776	New Bedford	Wreck Removal	10,000.00	Design 100%
2629	Quincy	Seawall	10,000.00	Design 20%
2762	Quincy	Shore Protection	100,000.00	Design 25%
2772	Revere	Sales Creek Study	22,000.00	
134B	Rockland	Skating rink	1,250,000.00	Design 100%
2767	Sandwich	Repairs to Tide Gate	7,000.00	Design 70%
129B	Sandwich Phase 2	Comfort Station	170,000.00	Design 100%
	Sandwich Phase 3	Beach Improvement	200,000.00	Design 30%
	Salem	South River	900,000.00	Design 100%
	Salisbury	Access Ramp	85,000.00	
	Swampscott	Beach Erosion Study	10,000.00	
	Swampscott	Hawthorne Brook Study	375,000.00	

DIVISION OF WATERWAYS

PROJECTS UNDER DESIGN OR IN PROCESS AS OF JUNE 30, 1973

<u>CONTRACT</u> <u>Number</u>	<u>LOCATION</u>	<u>TYPE OF WORK</u>	<u>EST. COST</u>	<u>REMARKS</u>
	Swansea	Stream Improvements	20,000.00	Design Pending
2752	Taunton	Dam Reconstruction	337,000.00	
	Tisbury	Russelton Head Study	5,000.00	Design 10%
2775	Tisbury	Shore Protection	39,000.00	Design 100%
2769	Wareham	Bulkhead Construction	80,000.00	Design 20%
2755	Wellfleet	Tidegate Repairs	136,000.00	Design 100%
2704	Worcester	Flood Control	500,000.00	Design 75%
	40 PROJECTS TOTAL		<u>\$7,771,000.00</u>	

DIVISION OF WATERWAYS

At the annual Division of Waterways Rivers and Harbors Hearing held April 12, 1973, the Division heard petitions from 60 municipalities for proposed projects to be done under the provisions of Chapter 91 of the General Laws. These 60 petitions represent over 134 separate projects, as many municipalities petitioned for more than one project.

The Division during fiscal 1973 held numerous public hearings for petitions for structures in, over or under tidewaters, great ponds and certain streams, and for excavation or dredging in the same. As a result of these public hearings approximately 170 licenses and 23 permits were granted.

Approximately \$213,000 was received for fees for tidewater displacement and for privileges granted under licenses in the Commonwealth tidelands.

The Division made over 350 field inspections to see that work done complied with the license or permit and on complaints of unlicensed work.

The Division under the provisions of Chapter 130, Section 27A and of Chapter 131, Section 40 of the General Laws as revised by Chapter 789, Acts of 1972 (the so-called Jones and Hatch Acts) receives notices from persons planning to fill or dredge in coastal or inland waters. The Division's function is to determine what jurisdiction, if any, comes under the provisions of Chapter 91 of the General Laws. Approximately 400 to 500 such notices are received annually.

DIVISION OF WATERWAYS

In the fiscal year 1973, under Chapter 595 of the Acts of 1970, approximately 490 dams have been inspected; approval given for new dams (9); dams removed from inspection list (27); and approval given for alterations to existing dams (10). Under Chapter 595 of the Acts of 1970, there are over 2704 dams in the Commonwealth that require periodic inspection.

Letters have been sent to 290 dam owners in the Commonwealth pointing out deficiencies to be corrected in their dams.

The Division annually reviews an average of 46 Land Court cases where rights of the public have to be protected in tidewaters and Great Ponds.

The Division during the fiscal year of 1973 supervised the transportation and offshore burning of combustible solid waste material from building demolition. Over thirty thousand tons of material were involved and it was towed to sea approximately 12 miles, well beyond the territorial limits of the Commonwealth for combustion.

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BUREAU OF SOLID WASTE DISPOSAL

During the past year, the Bureau has been active on a wide variety of fronts, in an attempt to resolve the solid waste problem. The following is a summary of the principal activities and endeavors of the Bureau during the past year, as well as a brief look at the Bureau's role in the forthcoming year.

The primary work of the Bureau of Solid Waste Disposal over the last 12 months has centered on developing a statewide master plan for solid waste management. This has involved a series of public hearings throughout the Commonwealth, in order to explain and discuss the Raytheon statewide systems analysis solid waste study, and also to afford an opportunity for the broadest possible public input and participation in the solid waste decision-making process. These statewide hearings were held in conjunction with the cooperation of the regional planning agencies, and provided the Bureau with information as to the unique problems and particular needs of various segments of the Commonwealth.

Subsequent to the series of statewide hearings, an inter-agency task force commenced work on drafting the State Master Plan for solid waste management. This effort involved the Bureau of Solid Waste Disposal; the Dept. of Public Health; the Dept. of Natural Resources; the Water Resources Commission; and the Dept. of Community Affairs.

During the past year, concurrently with the preparation of the State Master Plan, the Bureau has undertaken consultant engineering studies, aimed at solving short-term solid waste problems in critical need areas of the Commonwealth. Studies were carried out for Lawrence, Springfield and Worcester. The information gained and the data gleaned from these studies will be of assistance in the implementation

BUREAU OF SOLID WASTE DISPOSAL

of a state plan.

In addition to the foregoing, the Bureau has entered into a short-term consultant contract with the Arthur D. Little Co. of Cambridge to investigate and compare the costs and benefits to the Commonwealth of solid waste recycling strategies; to recommend the best alternative; and to lay the groundwork for the implementation of the preferred alternative. This study should be completed by December 1973. Two other areas of activity deserve discussion here; Legislation and the EPA planning grant.

The following is a brief summary of the Bureau's statutory authority:

The Bureau of Solid Waste Disposal within the Department of Public Works was created by Chapter 834, Acts of 1969. In 1971, significant legislation was enacted (Ch. 1023, Acts of 1971) which changed the scope and purposes for which the previously authorized 10 million dollar bond issue could be utilized. By virtue of this statute, the Bureau may use bond issue funds to engage consultants to provide technical assistance, and engage in a variety of study projects, in addition to the capital outlay purposes originally permitted.

Currently pending in the Great and General Court is House Bill #6643, which is vigorously supported by the Bureau, and is the cornerstone to implementation of any meaningful state master plan for solid waste management. This bill is essentially similar to legislation previously

BUREAU OF SOLID WASTE DISPOSAL

filed on behalf of the Bureau which did not receive favorable consideration in the state legislature. Briefly, House 6643 provides for the concept of mandatory regionalization with the Commonwealth to provide subsidies to municipalities for upgrading of solid waste disposal facilities and for construction of transfer stations and regional solid waste processing and disposal facilities. This enabling legislation is vital to carrying out the proposed state master plan, and it is hoped that this bill will become law before long, during the current session of the legislature.

The Bureau has applied for and received notification of award of an EPA planning grant to assist in implementation of the state master plan.

The proposed Environmental Protection Agency (EPA) solid waste management planning grant in the sum of \$62,000.00, will encompass activities throughout the Commonwealth. The funds provided to the Bureau of Solid Waste Disposal will be used to accomplish 3 basic activities in furtherance of program development. These activities are undertaken in conjunction with and to help effectuate the implementation of the state solid waste management plan. The activities we propose to focus on can be delineated in 3 broad categories, viz.:

Plan Maintenance - Legislative Activities, public relations programs, and education of the public at large.

BUREAU OF SOLID WASTE DISPOSAL

Enforcement - In conjunction with the State's public Health Department, to terminate operation of all noncompliant solid waste disposal facilities.

Technical Assistance - In conjunction with an enforcement program, we intend to supply technical assistance to communities for facility improvement and for opening new facilities with the program geared to implementation of regional solutions for solid waste management problems.

The Bureau has maintained close contact and continuous liaison with the EPA throughout, on an ongoing basis, and has participated in its activities, seminars, and projects.

In addition to all of the aforementioned activities, the Bureau is in the process of contracting with the various regional planning agencies throughout the Commonwealth for studies designed to update solid waste data and to investigate and inventory potential sites for solid waste processing and disposal. These studies, of 6 months' duration, will form the basis for a regional approach to solid waste management, and at the same time provide local input and participation in solid waste planning through R.P.A. liaison. It is anticipated that work under these proposed contracts will commence within the next 60 days.

The Bureau of Solid Waste Disposal has engaged in a continuing, comprehensive planning program in conjunction with the regional planning agencies, in order to develop regional components of a state master plan for solid waste management. The prime reasoning behind this approach lies in the fact that the regional planning agencies in the

BUREAU OF SOLID WASTE DISPOSAL

Commonwealth provide an organized planning group geared to provide local input into overall state planning. Many of their past studies, particularly land use and transportation studies, relate directly to solid waste management and disposal. The Raytheon Statewide Solid Waste Management Report recommended methods of disposal and the proposed grouping of communities.

No single grouping or method can be finalized without local input. Accordingly, the regional planning agencies will recommend disposal districts, the location of transfer stations, and identify sites for regional processing and disposal facilities. The recommended districts and regional processing and disposal sites will be presented to the district and regional officials and residents at open public meetings conducted by the Regional Planning Agencies.

Upon completion of the meetings, final recommendation will be submitted to the Bureau of Solid Waste Disposal for evaluation. The Bureau of Solid Waste Disposal will then undertake the implementation of a unified solid waste disposal program.

During the past year there were several staff changes in the Bureau. The Bureau's first Director, Howard Whitmore, Jr. retired from state service. Also, Charles Agrillo, a long time D.P.W. employee retired. John Gallagher, Assistant Director and Lawrence Partridge, Jr., technical consultant have also left the Bureau. Appointed new Bureau Director was Alden E. Cousins formerly head of the Office of Environmental Protection in the Water Resources Commission. William P. Gaughan replaced Mr. Gallagher as Assistant Director.

In summation, the Bureau has embarked upon a broad-ranging

BUREAU OF SOLID WASTE DISPOSAL

program of activities encompassing all aspects of solid waste management. It will require a determined effort to attain our objectives, as well as new legislation and a firm commitment to solve the solid waste problem.

LEGISLATION

1973 - RECOMMENDATIONS

1. AN ACT REQUIRING THE OPERATION OF A VEHICLE TO AND UPON THE SCALE ADJACENT TO A HIGHWAY.

There is nothing in the present law which would require the operator of a commercial vehicle to drive on to state operated scales. This bill would provide such a requirement.

2. AN ACT PROVIDING FOR THE OPERATION OF VEHICLES DURING INCLEMENT WEATHER AND UNDER HAZARDOUS CONDITIONS.

This bill would require that vehicles being operated during icy highway conditions shall have skid chains or special traction tires installed on no less than one pair of drive wheels.

3. AN ACT REQUIRING SECURE COVERAGE AND ENCLOSURE OF CERTAIN LOADS WHILE TRAVERSING THE WAYS OF THE COMMONWEALTH.

This bill would add to the present law which prohibits dropping or leaking loads the further requirement that - "when said load consists of material that is loose or can become unbound" - it shall be - "fully, adequately and securely covered and enclosed." The bill also revises the second sentence of the law which provides for dropping sand, water and other substances on the highway for maintenance purposes:

4. AN ACT INCREASING THE PENALTY FOR DISPOSAL OF GARBAGE OR REFUSE IN CONTAINERS ALONG HIGHWAYS AND IN REST AREAS.

This bill provides for increasing the penalty for disposal of household or commercial garbage or refuse in a container along the highway or in a rest area from \$50.00 to \$200.00.

5. AN ACT AUTHORIZING AND DIRECTING THE TRANSFER OF CERTAIN BRIDGES.

This bill provides for the transfer of the two bridges on Commonwealth Avenue over the Muddy River in Boston to the M.D.C.

LEGISLATION

1973 - RECOMMENDATIONS (CONT'D)

6. AN ACT RELATIVE TO RAILROAD BRIDGES.

This bill would clarify the recent law which transferred railroad bridges to the Department of Public Works by providing that "such bridges shall be State Highway".

7. AN ACT REPEALING CHAPTER 358 OF THE ACTS OF 1972.

Chapter 358 of the Acts of 1972 directed the Department of Public Works to maintain the traffic control signals at the intersection of Route 38 and 113 in the town of Dracut.

8. AN ACT RELATIVE TO DEPARTMENT OF PUBLIC WORKS ADMINISTRATIVE PERSONNEL.

This bill provides for increasing the assistants to the Commissioner of Public Works to seventeen.

9. AN ACT AUTHORIZING CERTAIN TURNING MOVEMENTS AT INTERSECTIONS.

This bill would require the operator of a vehicle making a turn at an intersection to turn left from the available left turn lane and to turn right from the right lane.

10. AN ACT RELATIVE TO SCHOOL ZONES.

This bill provides for the amendment for department approval of Chapter 810 of the Acts of 1971. This act required the Department of Public Works to pay for the installation of School Zones even at locations where, in our opinion such controls should not be used.

11. AN ACT CLARIFYING CHAPTER 614 OF THE ACTS OF 1971.

This bill would correct the provisions of Chapter 614 of the Acts of 1971 by revising the language of the second paragraph of Item #1 to provide for an equestrian overpass instead of an underpass and to change the location from the town of Rowley to the town of Georgetown.

1973 - RECOMMENDATIONS (CONT'D)

12. AN ACT PROVIDING FOR THE INSTALLATION OF TRAFFIC SAFETY DEVICES AT ROADSIDE DEVELOPMENT LOCATIONS ADJACENT TO STATE HIGHWAYS.

This bill would require the developers of roadside properties to participate in the cost of traffic safety devices necessary because of traffic generated by new developments.

13. AN ACT PROVIDING FOR THE OPERATION OF INFORMATION FACILITIES ON LIMITED ACCESS HIGHWAYS.

This bill would provide for the operation of information service facilities on limited access highways subject to approval of the federal highway administration.

14. AN ACT CLARIFYING THE PROVISIONS FOR ASSISTANCE TO CITIES AND TOWNS TO ELIMINATE ACCIDENTS AT HIGH ACCIDENT LOCATIONS.

Chapter 519 of the Acts of 1967 inserted in Chapter 90 of the General Laws a new section which provided 75% state assistance to cities and towns in eliminating high accident locations through the installation of suitable traffic control devices. This proposal revises the original Act by requiring and authorizing the state to pay 100% of the cost.

15. AN ACT RELATIVE TO THE HIGHWAY ENGINEER INTERN PROGRAM OF THE DEPARTMENT OF PUBLIC WORKS.

This bill would eliminate the limit of seven highway engineering interns and would further provide for intern applicants to be eligible to the civil service examination upon completion of the junior year in an engineering course.

16. AN ACT AUTHORIZING THE REIMBURSEMENT OF LEGAL EXPENSE TO JOHN R. HORAN, AN EMPLOYEE OF THE DEPARTMENT OF PUBLIC WORKS.

This bill provides for discharging a moral obligation of the commonwealth by reimbursing a state employee for legal expense incurred

LEGISLATION

by him in his defense of actions charged against him while in the performance of his official duties.

LAND TAKINGS

17. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO ACQUIRE CERTAIN OTHER PUBLIC LANDS FOR HIGHWAY PURPOSES. (NEWBURYPORT)

This bill provides for the transfer of approximately 4.84 acres of land in the city of Newburyport for I-95 construction (4.56 acres), and the reconstruction of the Hale Street overpass (0.28 acres).

18. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO ACQUIRE CERTAIN OTHER PUBLIC LANDS FOR HIGHWAY PURPOSES. (ORANGE)

This bill authorizes the transfer of two parcels of town-owned land a pumping station facility (4.0 acres) and 3 acres of municipal airport land in the town of Orange for the construction of Route 2.

19. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO ACQUIRE CERTAIN OTHER PUBLIC LANDS FOR HIGHWAY PURPOSES. (SOUTHAMPTON)

This bill authorizes the transfer of two parcels of land owned by the Southampton Conservation Commission for the construction of Route 10. One parcel 0.248 acres the other 0.210 acres.

20. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO ACQUIRE CERTAIN OTHER PUBLIC LANDS FOR HIGHWAY PURPOSES. (BREWSTER)

This bill provides for the transfer of approximately 1.70 acres of Grassy Pond along the eastbound roadway of Route 6 for the construction of the Southeast ramp entering Route 6.

21. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO ACQUIRE CERTAIN OTHER PUBLIC LANDS FOR HIGHWAY PURPOSES. (ATHOL)

This bill provides for the transfer of approximately 1.1 acres of land owned by the town of Athol for the construction of Route 2.

LEGISLATION

LAND TAKINGS (CONT'D)

22. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO ACQUIRE CERTAIN OTHER PUBLIC LANDS FOR HIGHWAY PURPOSES. (BROCKTON)

The Department proposes the relocation of Route 37 in Brockton approximately 1800 feet north of its present intersection with Route 28, North Montello. The proposed relocation will be approximately 1350 feet long with a nominal width of 44 feet. There will be a five-foot bituminous concrete sidewalk on each side 2.1 acres of city owned land will be necessary for construction and slope easements.

23. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO ACQUIRE CERTAIN OTHER PUBLIC LANDS FOR HIGHWAY PURPOSES. (WORCESTER)

This bill provides for the transfer of two parcels of land in the city of Worcester to the Department of Public Works for the construction of Route 52.

1. 2.5 acres, a narrow strip of the northeast corner of Indian Lake near Shore Drive and Stores Street now under the control of the city of Worcester.
2. Approximately 2.5 acres of West Boylston Street School (total taking of land and building) now under control of Worcester School Department.

24. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO ACQUIRE CERTAIN OTHER PUBLIC LANDS FOR HIGHWAY PURPOSES. (AMHERST)

This bill provides for the acquisition of 52 acres owned by the University of Massachusetts in Amherst. The acquisition of this land is necessary for the construction of a by-pass for Pleasant Street.

25. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO ACQUIRE CERTAIN OTHER PUBLIC LANDS FOR HIGHWAY PURPOSES. (WALTHAM)

This bill provides for the acquisition of approximately 4.86 acres of land owned by the city of Cambridge in Waltham at Winter Street and Route 128.

LEGISLATION

LAND TAKINGS (CONT'D)

26. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO ACQUIRE CERTAIN OTHER PUBLIC LANDS FOR HIGHWAY PURPOSES. (SAUGUS)

This bill provides for the transfer of approximately 1 acre of Breakheart Reservation in Saugus from the M.D.C. to the Department of Public Works for the reconstruction of Route 129.

27. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO ACQUIRE CERTAIN OTHER PUBLIC LANDS FOR HIGHWAY PURPOSES. (PLYMOUTH, KINGSTON)

This bill would authorize the Department to acquire three parcels of public land in the town of Plymouth and one parcel in the town of Kingston for the construction of Route 44.

1. Town of Plymouth owner 4.21 acres.
2. Plymouth Welfare Department owner, 15.77 acres, and 2181 acres in the town of Kingston.
3. Plymouth Cemetery Department 8.30 acres.

28. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO ACQUIRE CERTAIN OTHER PUBLIC LANDS FOR HIGHWAY PURPOSES. (MANSFIELD-NORTON)

This bill would authorize the Department to acquire approximately 18.8 acres in Mansfield and approximately 1.82 acres contained in three parcels in Norton all presently owned by the Mansfield Municipal Airport Commissioner. These acquisitions are necessary for the construction of Route 25.

It should be noted that a hardship taking is necessary to release Federal Funds for M.M.A.C. to extend runways and/or taxi ways which would also include an Instrument Landing System. Glide path easements are to be considered also.

LEGISLATION

LAND TAKINGS (CONT'D)

29. AN ACT AUTHORIZING THE DEPARTMENT TO ACQUIRE CERTAIN OTHER PUBLIC LAND FOR HIGHWAY PURPOSES. (SUTTON-UXBRIDGE)

This bill authorizes the transfer of approximately 36 acres of the Sutton State Forest in Sutton and Uxbridge presently under the control of the department of Natural Resources for the construction of Route 146.

30. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO ACQUIRE CERTAIN OTHER PUBLIC LANDS FOR HIGHWAY PURPOSES. (LENOX)

This bill would authorize the transfer of approximately 2.0 acres of Aspinwall Park in the town of Lenox to the Department for the construction of Route 7.

RIGHT OF WAY BUREAU

31. AN ACT TO AMEND THE 1972 ACCELERATED HIGHWAY BOND ISSUE TO PROVIDE FOR CERTAIN FEDERAL AID.

An act to amend the 1972 Accelerated Highway Bond Issue in order to provide the federal requirements contained in United State Code, Title 23 and other federal laws.

32. AN ACT TO AMEND THE AUTHORITY OF THE DEPARTMENT OF PUBLIC WORKS TO COOPERATE WITH THE UNITED STATES OF AMERICA.

An act to amend the provisions of Section 30, Chapter 81 of the General Laws, so that the department may be authorized to do all things necessary under Title 23 of the United States Code as well as the provisions of the Uniform Relocation Assistance and Land Acquisition Policies Act of 1970.

33. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO PAY ASSIGNEES OF RELOCATION PAYMENTS.

An act to amend the provisions of Section 7J of Chapter 81 of the General Laws to permit the assignment of relocation payments by the relocatee.

LEGISLATION

RIGHT OF WAY BUREAU (CONT'D)

34. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS IN CERTAIN CASES TO REFER THE MATTER OF PAYMENT OF THE AWARD FOR DAMAGES TO THE ATTORNEY GENERAL OF THE COMMONWEALTH FOR JUDICIAL DETERMINATION.

An act to authorize the Department of the Attorney General to seek judicial determination as to the disposition of land damage monies heretofore unable to be paid because of legal or other deficiencies.

35. AN ACT AUTHORIZING THE COMMONWEALTH TO PETITION THE LAND COURT TO CLEAR UP DEFECTS IN TITLES.

This bill would authorize the Attorney General to take steps to clarify interests in land acquired so that the owner of less than a full fee could be paid his share without initiating his own law suit.

36. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO PROVIDE CERTAIN ROADSIDE FACILITIES, INCLUDING PARKING AREAS, AT THE SIDE OF LIMITED ACCESS WAYS.

An act authorizing the department to erect information centers and other related facilities at the sides of highways for the safety and convenience of the traveling public.

37. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO COMPLY WITH THE FEDERAL UNIFORM RELOCATION ASSISTANCE AND REAL PROPERTY ACQUISITION POLICIES ACT OF 1970.

An act authorizing the department to make the same relocation payments as are provided under the Uniform Relocation Assistance and Land Acquisition Policies Act of 1970, whether takings by the department are for Federal-aid or non-Federal-aid projects.

38. AN ACT TO AUTHORIZE THE DEPARTMENT OF PUBLIC WORKS TO CONSTRUCT DECENT, SAFE AND SANITARY HOUSING FACILITIES.

An act authorizing the department to construct necessary replacement housing as a last resort when sufficient decent, safe and sanitary housing cannot be found within the State Highway project area

LEGISLATION

RIGHT OF WAY BUREAU (CONT'D)

39. AN ACT AUTHORIZING THE BOARD OF REGIONAL COMMUNITY COLLEGES TO TRANSFER CARE, CONTROL AND MAINTENANCE OVER CERTAIN LAND IN BOSTON TO THE DEPARTMENT OF PUBLIC WORKS FOR RECONSTRUCTION OF THE PRISON POINT BRIDGE.

An act authorizing the Board of Regional Community Colleges to transfer the care, control and maintenance over three parcels of land near the so-called Prison Point Bridge to the department to permit reconstruction of the Prison Point Bridge.

40. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO PAY FOR ACQUISITION OF ROUTE 95 RESTAURANT AND COMFORT STATION IN THE TOWN OF ROWLEY.

An act authorizing the department to pay compensation for takings of service stations, restaurants and comfort stations abutting Interstate Route 95.

41. AN ACT CLARIFYING THE PROCEDURE FOR THE PAYMENT OF LAND DAMAGE CLAIMS TO CITIES AND TOWNS.

This bill would set up a statutory procedure for the payment of pro tanto awards to cities and towns where the subdivisions refuse to accept payment.

42. AN ACT PROVIDING FOR THE ESCHEAT OF UNCLAIMED CHECKS IN THE EMINENT DOMAIN TRUST FUND TO THE COMMONWEALTH.

This bill provides for the escheat of unclaimed checks in the Eminent Domain Trust Fund to the commonwealth after two years.

43. AN ACT AUTHORIZING THE TAKING OF MOBILE HOMES WHICH ARE DETERMINED TO BE PERSONAL PROPERTY.

This bill would authorize the Department to purchase mobile homes from displacees where they are appraised as personal property in order to ease relocation difficulties. Said purchases are not allowed under existing law.

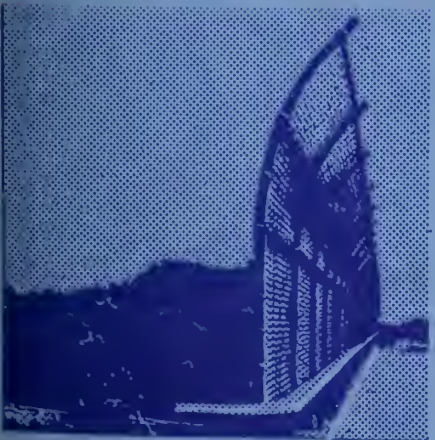
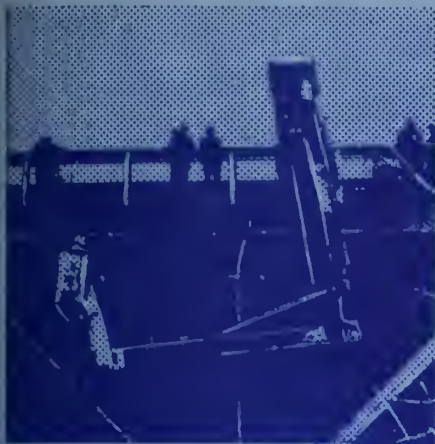
LEGISLATION

RIGHT OF WAY BUREAU (CONT'D)

44. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO ACQUIRE LAND IN BEHALF OF PUBLIC UTILITY COMPANIES FOR THE PURPOSE OF RELOCATING THE FACILITIES OF SAID COMPANIES.

An act authorizing the department to take by Eminent Domain other adjacent land in lieu of damages when utility facilities are required to be relocated.





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COLLECTION
1975, 1976

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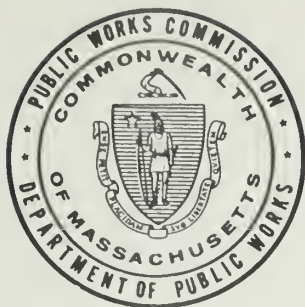
ANNUAL REPORT

MASSACHUSETTS

DEPARTMENT of

PUBLIC WORKS

FISCAL YEAR • JULY 1, 1974 to JUNE 30, 1975



ANNUAL REPORT

JULY 1, 1974 THROUGH JUNE 30, 1975

COMMONWEALTH of MASSACHUSETTS

MICHAEL S. DUKAKIS
Governor

FREDERICK P. SALVUCCI
Secretary of
Transportation & Construction

DEPARTMENT OF PUBLIC WORKS

JOHN J. CARROLL
Commissioner
ROBERT T. TIERNEY
Chief Engineer



The Commonwealth of Massachusetts

Executive Office of Transportation and Construction

Department of Public Works

Office of the Commissioner

100 Nashua Street, Boston 02114

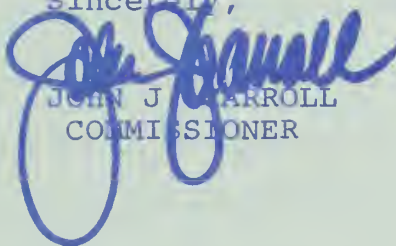
November 21, 1975

His Excellency Governor Michael S. Dukakis,
Frederick P. Salvucci,
Secretary of Transportation and Construction
and the Great and General Court of the
Commonwealth of Massachusetts

Gentlemen:

I am transmitting herewith our Department's Annual Report for the fiscal year ended June 30, 1975. I am pleased to note that during this period, the Department advertised some \$220,000,000 in highway construction contracts, more than any other previous fiscal year.

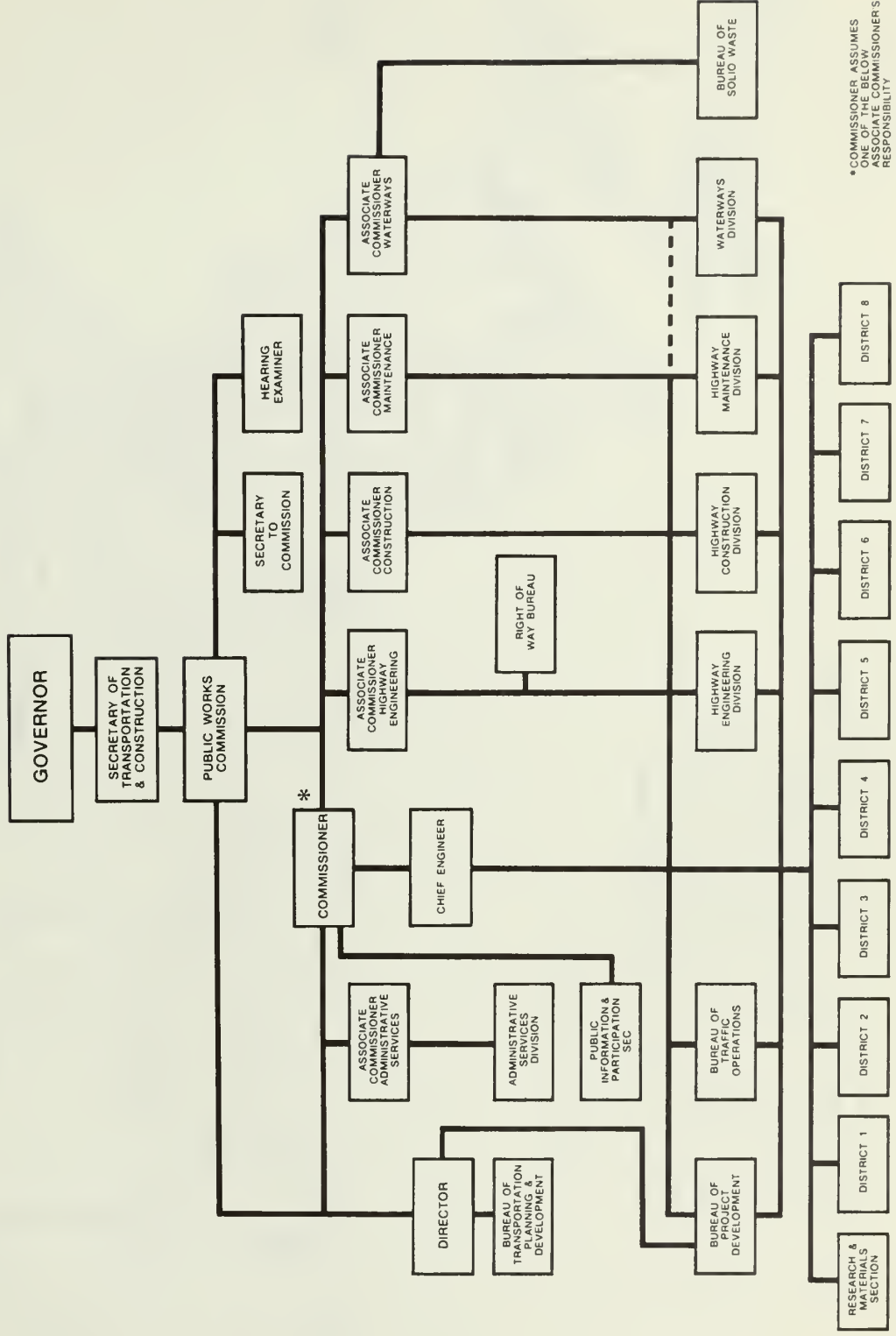
Sincerely,


JOHN J. CARROLL
COMMISSIONER

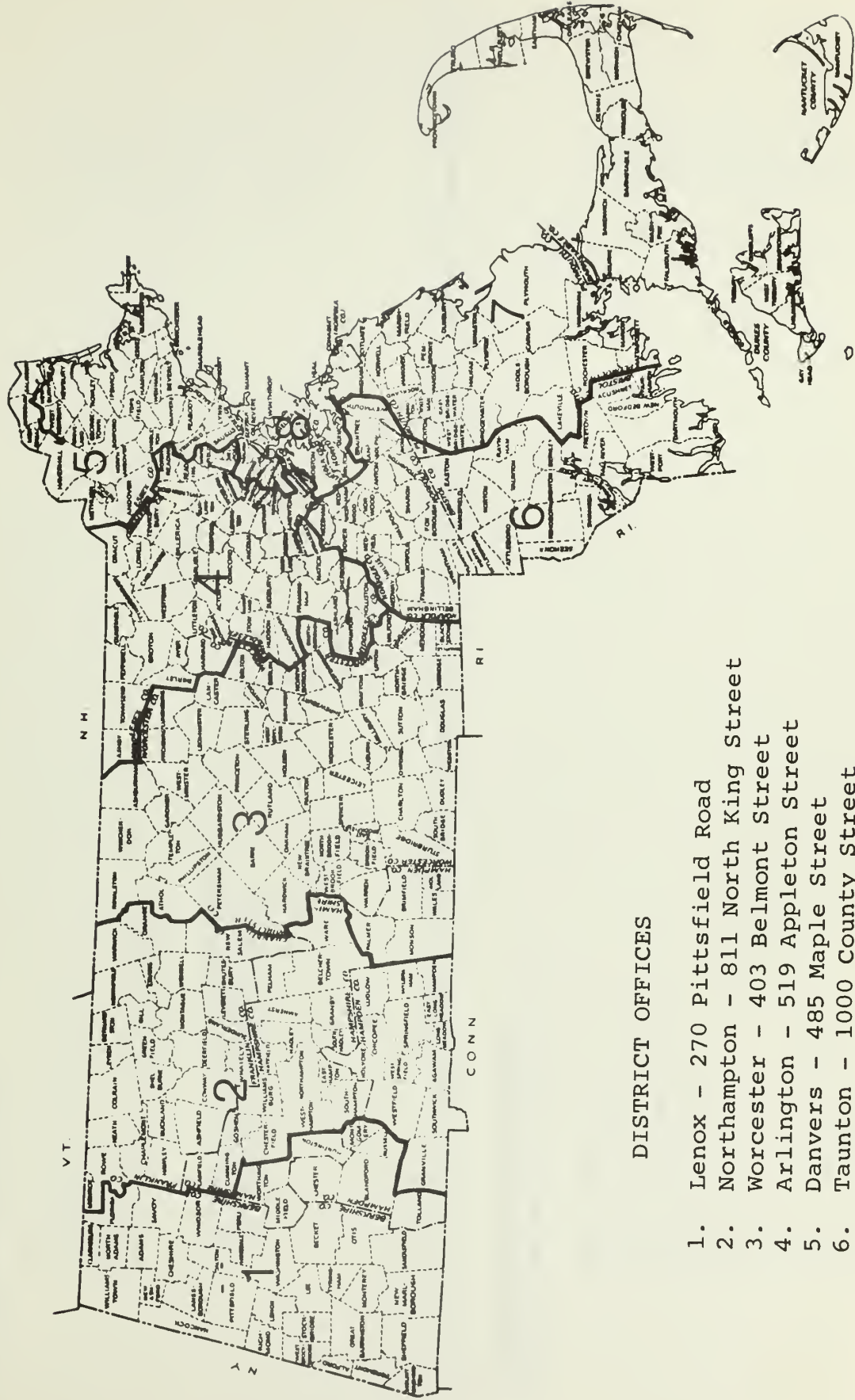
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Massachusetts Department of Public Works



MASS. D.P.W. DISTRICT BOUNDARIES



DISTRICT OFFICES

1. Lenox - 270 Pittsfield Road
2. Northampton - 811 North King Street
3. Worcester - 403 Belmont Street
4. Arlington - 519 Appleton Street
5. Danvers - 485 Maple Street
6. Taunton - 1000 County Street
7. Middleborough - 151 Pierce Street
8. South Boston - 400 "D" Street

Number of Employees in the Massachusetts Department of Public Works (1975)

Functional Distribution

Policy and Planning	212
Construction and Engineering	1,620
Maintenance	2,327
Administrative Support and Overhead	400
Sub-total	4,559
Waterways Engineering and Administration	50
Solid Waste Planning and Administration	8
Total	4,617

Geographical Distribution

(excludes Waterways & Solid Waste Divisions)

Boston Headquarters	1,162
District 1 (Lenox)	227
District 2 (Northampton)	354
District 3 (Worcester)	439
District 4 (Arlington)	453
District 5 (Danvers)	394
District 6 (Taunton)	633
District 7 (Middleborough)	440
District 8 (Boston)	255
Wellesley (Maintenance and Sign Shop)	135
Wellesley (Research and Materials)	67
Total	4,559

SUMMARY OF DPW
HIGHWAY CONSTRUCTION AND MAINTENANCE

<u>CALENDER YEAR</u>	<u>ACCELERATED HIGHWAY PROGRAM ACTS</u>	<u>\$ VALUE OF CONST. PROJECTS ADV.</u>	<u># LANE MILES STATE HWYS. MAINTAINED</u>
1960	\$ 86,000,000	\$ 75,000,000	7049
1961	90,000,000	73,000,000	7243
1962	110,000,000	79,000,000	7522
1963	125,000,000	86,000,000	8133
1964		73,000,000	8300
1965	320,000,000	62,000,000	8614
1966		90,000,000	8443
1967	300,000,000	101,000,000	8754
1968		63,000,000	8936
1969	260,000,000	173,000,000	9266
1970		63,000,000	9395
1971		79,000,000	9530
1972	561,000,000	143,000,000	9780
1973		92,000,000	10550
1974		136,000,000	11438
1975		200,000,000 est.	11700 est.

5 YEAR SUMMARY (AVERAGE/YEAR)

<u>CONSTRUCTION PROJECTS ADV. (\$)</u>	<u># LANE MILES MAINTAINED</u>
1961-1965 75 million	8,000
1966-1970 100 million	9,000
1971-1975 130 million	10,500

PROJECTS ADVERTISED

(Fiscal Year 1975)

July	1974	\$ 3,118,790
August	1974	18,413,159
September	1974	4,513,223
October	1974	23,959,170
November	1974	17,219,583
December	1974	3,182,741
January	1975	4,749,233
February	1975	3,948,071
March	1975	10,766,489
April	1975	6,739,636
May	1975	93,301,165
June	1975	<u>30,723,821</u>
TOTAL		\$ 220,622,081

MASSACHUSETTS FEDERAL HIGHWAY ADMINISTRATION
APPORTIONMENTS

<u>Category</u>	<u>Fiscal Year 1974</u>	<u>Fiscal Year 1975</u>	<u>Fiscal Year 1976</u>
Interstate	76,871,399.	91,864,780.29	99,094,511.39
Primary Rural	6,878,393.	6,878,393.	7,702,920.
Secondary Rural	3,203,856.	3,319,883.	3,710,370.
Urban System	23,166,375.	23,697,608.	23,760,384.
Urban	8,939,920.	9,516,340.	9,248,193.
Priority Primary	1,982,718.	4,006,315.	5,952,685.
Hwy. Planning Research (1½%)	1,843,286.	2,084,128.	2,117,850.
MTA Planning (½%)	804,091.	906,375.	922,320.
High Hazard Locations	1,083,646.	1,642,234.	1,626,225.
Elim. Rds. & Obstacles	541,824.	1,642,234.	1,626,225.
Safer Rds. Demonstration	1,099,411.	2,198,820.	2,102,907.
Rail-Hwy. Crossings	490,765.	1,487,472.	1,294,977.
Pavement Marking Fund	152,492.	462,191.	0.
Off System Roads	<u>0.</u>	<u>0.</u>	<u>1,349,555.</u>
TOTAL	\$127,058,176.	\$149,706,773.29	\$160,509,122.39

BUREAU OF TRANSPORTATION PLANNING & DEVELOPMENT

The Bureau of Transportation Planning and Development is charged by the Legislature with the primary responsibility for transportation planning within the Commonwealth and with coordinating the transportation related efforts of other State agencies.

Since its formation in 1964 as part of the State's response to the 3-C process requirement of the 1962 Federal Highway Act (the call for comprehensive, cooperative and continuing planning in urbanized areas), the BTP&D's role has changed significantly. While the Bureau has retained its functions of data management and technical analysis, it has shifted its emphasis to the development and support of a policy-oriented, decentralized and participatory planning process, involving consideration of a broad range of impacts and improved interagency coordination. This evolution of BTP&D's role is part of the major reorganization of the transportation planning and decision making process within the State - an effort aimed at revitalizing the 3-C process so as to meet Federal requirements in spirit as well as in letter of the law, and to achieve the State's goal of cooperative development of a balanced transportation system.

To document the 3-C planning process, Federal law has required each State to produce an "Action Plan". The Director and staff members of BTP&D played key roles in the development of the Massachusetts Action Plan, which was approved in the past fiscal year and is now being implemented.

The continuing implementation of the 3-C process is focused upon the thirteen regional planning jurisdictions that encompass all 351 communities in the Commonwealth. Within each of these regions, there has been formed a transportation policy advisory group (TPAG). Decisions for transportation improvements are made by the statutory State agencies only after full consultation with these TPAGs. The Regional Planning Agency (RPA), the professional planning organization for each region, provides staff support to the TPAG. The regional liaison section of BTP&D coordinates the technical analysis and support functions of BTP&D with the efforts of the RPA staff. This coordination is reflected in the preparation and implementation of "unified work programs" for each region. Coordination of the planning activities of the several agencies involved in such areas as land use, air quality and economic development is handled by the Bureau's interagency liaison section, working with the Office of State Planning.

Technical analysis and data management activities of the Bureau are carried on through supervision of consultant contracts, as well as through in-house work. The primary activities in this area are:

- on-going data collection and data management
- special Statewide planning studies, area studies and project studies
- on-going program development activities
- research

The continuing data collection and management activities include the updating of physical inventories and travel inventories. Field operations for the completion of the road inventory program were completed in 1975. In a related activity, the updating of the 1968 functional classification system, used for need determination, financing of projects, and assignment of jurisdictional responsibility, was completed.

A major responsibility of the Bureau is to translate raw traffic count data into refined traffic movement estimates for design purposes. Travel (or operations) inventory updating include the traffic count program, truck surveys, origin-destination surveys, and the publishing of the 1972 Traffic Volume Report.

Statewide studies which either started or continued this year included studies of staggered work hours, bicycle routes, scenic roads and railroad network and right-of-way evaluation. Specific project studies included an economic evaluation of the Fore River Bridge. Area-wide studies included the Springfield Community Impact Study and the completion of the Planning Study Designs for the Montachusett and Berkshire regions.

Continuing program development activities include the preparation of various fiscal studies, the design and start of implementation of a project information system and the start of the development of a Statewide transportation capital improvement program.

The immediate priority of the Bureau is the fine-tuning of the relationship among the RPAs, TPAGs and itself; specifically dealing with the question of how local, regional and State priorities are combined into a work program.

Additionally, BTP&D faces the challenge of activating wide and effective community participation in the TPAG. In adapting to the changes in emphasis of its responsibilities, BTP&D seeks to maintain the momentum it has achieved towards its goal of initiating planning in a decentralized and open process, rather than only responding to requests for technical information.

In this connection, a major responsibility and accomplishment of the Bureau in 1975 was the reorientation of state and regional planning activities to integrate inter-disciplinary programs on a comprehensive regional and corridor planning study basis (Action Plan) with multi-modal transportation as an element in a total process including land use, economic, social and environmental factors. The reorientation was achieved in close co-operation with the Office of State Planning and produced (1) a general regional planning study outline for use by all 3C agencies in reshaping regional unified work programs and (2) two specific regional planning study designs and work programs: Berkshire (BCRPC) and Montachusett (MRPC). For other regions, it is anticipated that, within the regional planning study format, a corridor planning study emphasis will produce a series of issue-oriented studies which can be aggregated as areawide studies.

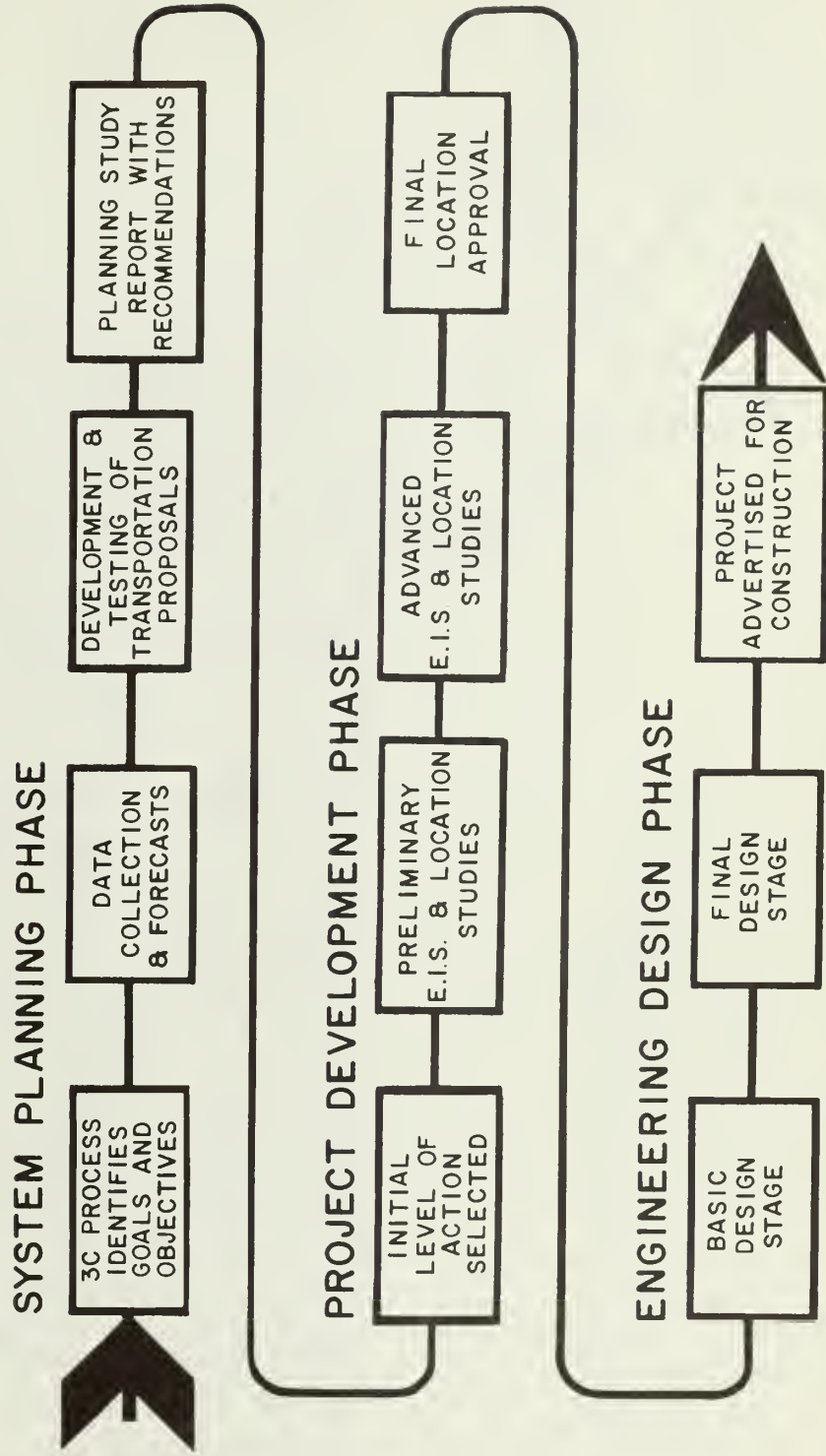
The major thrust of the reorientation is integration of a variety of federally-funded programs (DOT-3C, EPA-208, HUD-701, EDA, etc.) and state counterpart activities to eliminate duplication and conflict and, thereby, improve productivity and utility despite the reduced commitment of personnel and resources required by current budget constraints.

The major achievements of the BTP&D during 1975 are summarized below:

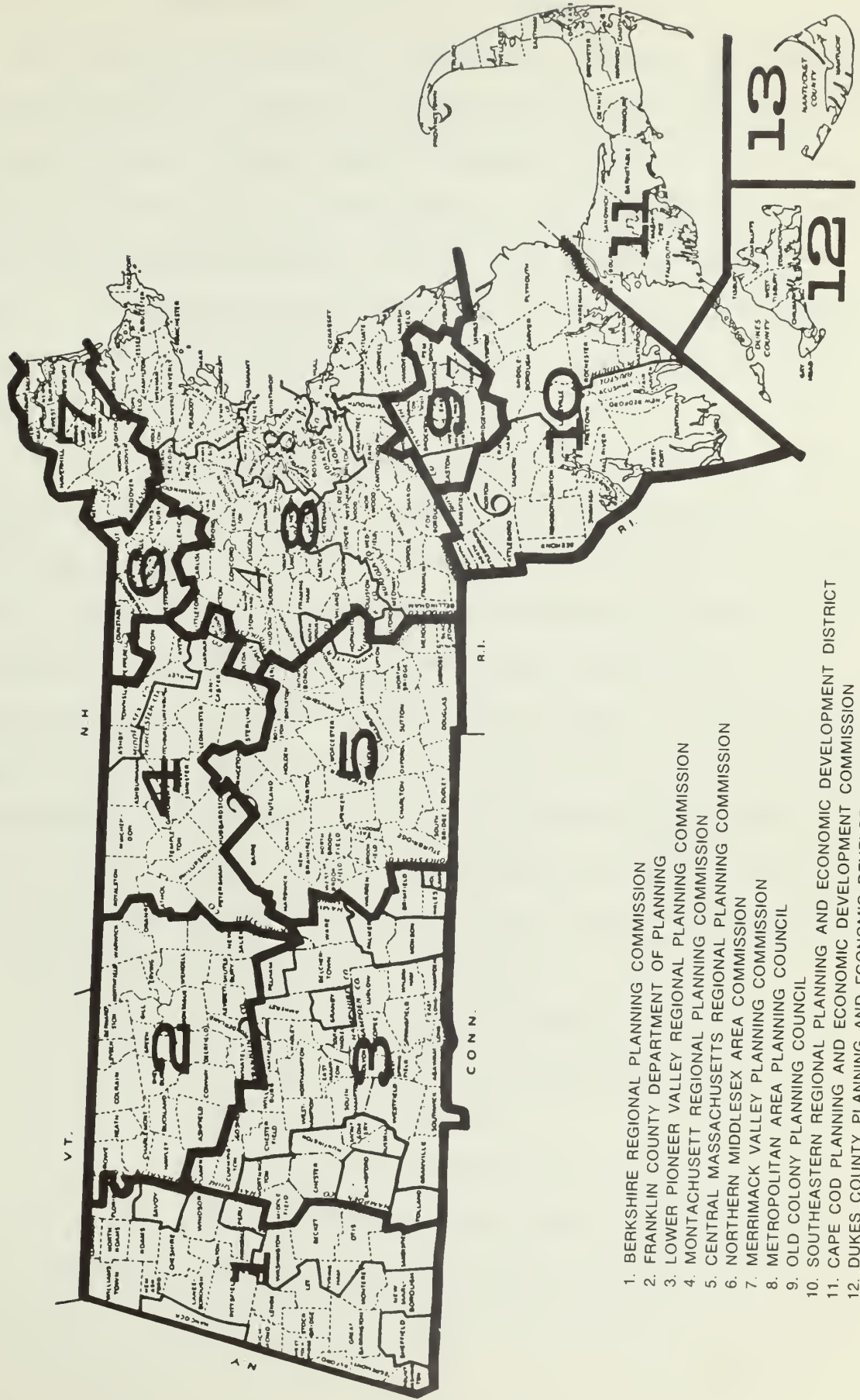
1. The development of a preliminary draft of Highway Priorities.
2. The development of a Project Information System.
3. Significant improvements to the statewide traffic counting programs.
4. Status Report on Transportation Planning.
5. Regional Planning Studies.
6. Corridor Planning Studies.
7. Bike Path Plans and Programs.
8. New map series.
9. Regional and Statewide networks.
10. Technical Guidelines.
11. Completed the Fore River Bridge economic analysis study.
12. Completed the land use mapping and initiated development of a forecasting process for the entire state.
13. Made substantial progress in re-aligning the Federal-Aid highway system based upon an approved functional classification plan.

14. Made substantial progress in coding and keypunching highway inventory data and planning the data in computer files.
15. Participated actively in programs being established by the newly formed Office of State Planning to integrate state agency planning on a comprehensive basis including RPS (5).
16. Completed various U.S. DOT mandated data collection efforts.

STEPS IN THE DEVELOPMENT OF A TRANSPORTATION PROJECT IN MASSACHUSETTS



MASSACHUSETTS REGIONAL PLANNING AGENCIES



BUREAU OF PROJECT DEVELOPMENT

The "Project Development phase" of transportation studies commences when the "Systems Planning phase" has been completed. In other words a project can be developed after it has been justified through the "3-C" process; a continuing, cooperative and comprehensive planning effort. This System Planning phase is total transportation planning within the Commonwealth in cooperation with other state agencies and regional planning agencies.

Project Development is responsible for the study of transportation alternatives within a corridor location. Continuing with the "3-C" process and broad citizen participation, the Bureau develops various alternatives within the corridor. It prepares preliminary plans and profiles and cost estimates, and develops the soci-economic, environmental impacts for each alternative. The end product is a "recommended alternative" with a basic design and environmental impact statement. After a Public Hearing the project is either acceptable for further design or it is recycled for further consideration.

The Bureau has four major sections:

- (1) Location and Survey
- (2) Geodetic and Photogrammetric
- (3) Environmental
- (4) Special Projects

The joint effort of the four sections is responsible for completing the project development phase of transportation projects.

Geodetic Survey Section

The function of the Geodetic Survey Section of the MDPW is to establish and maintain, horizontal and vertical control within the Commonwealth. The section provides services to municipalities, private surveyors and consultants with control data throughout the year.

Over this past year it has had a continuous program for state-wide recovery of Geodetic Survey markers that is successfully bringing our records up to date.

A program has been implemented to introduce Geodetic Survey methods to district survey personnel to enhance our efficiency within the Department.

Geodetic field crews are continuously running control traverse; setting measurements; measuring horizontal angles, slopes and zenith distances; doing field reconnaissance; determining differences in elevations and writing the descriptions to aid in the location of control stations.

The office force checks and abstracts the field books; adjusts triangulation, traverse and level data; maintains a control data file of approximately 20,000 positions; and plots control stations on topographical maps by coordinates.

The Section works in close cooperation with the U.S. National Geodetic Survey on surveys within the limits of the Commonwealth, and administers the cooperative mapping project with the U.S. Geological survey; maintains the records of the town line boundaries;

reviews proposed town boundary changes prior to enactment by the legislature; and advises State, County, and Municipal agencies in the planning and adjustment of town line surveys.

At present several in-house computer programs have been developed to resolve Geodetic Survey problems. A series of programs by U.S. National Geodetic have been rewritten, modified and updated by this Section to better suit our needs. One such program to compute plane coordiante traverse adjustments will be used to strengthen our statewide network. Use of these newly developed programs will insure a faster and more efficient method of handling the vast amount of control survey data received daily by the Section.

Survey Section

Although the Survey Section is not one of the more glamorous organizations in the Department, it does perform quite essential service, as it administers all Department survey operations except those of Waterways. These operations are carried out by survey personnel in the eight districts, the personnel consisting of some 24 supervisors and assistants, 65 state parties and 66 private parties, or about 550 men. Survey men are working on projects from pre-design through the final survey of the facilities, providing services without which our highways and bridges could be neither designed nor built.

The Survey Section is gradually acquiring new and better equipment as availability of funds dictates, and has a quantity of equipment such as target sets, automatic levels, theodolites, modern transits with optical plummets and a tackemoeter. Also, it now has three infra-red electronic measuring devices and hopes to acquire one more per year to outfit ultimately all districts. Thirty (30) new hand calculators have also been purchased to aid survey field personnel. Twenty-three (23) new van type vehicles are being procured to replace older and smaller carryalls. These provide twice the storage space of the older trucks and will be able to carry not only personnel and survey equipment but also an increased amount of safety equipment such as signs, cones, elevated flags and so on.

Location Section

Approximately 21 in-house location studies are presently in an active phase for an average of 32 miles of highways, in addition to miscellaneous projects. This section is monitoring consultant contracts for a total worth of \$2,750,000 involving nine separate contracts for a distance of 52 miles.

Several employees attended Highway Traffic Noise Abatement workshops and Air Pollution classes. In keeping with efficient and good management techniques, a staff member attended the Leadership and Communication Seminar.

At present, Locations has been assigned the responsibility to study schemes of depressing the Central Artery in the City of Boston. The method of approach is unique since it allows traffic on the Central Artery to continue uninterrupted while construction is underway.

Photogrammetric Section

The Photogrammetric Section is responsible for obtaining and furnishing aerial photography and aerial photogrammetric survey plans for various types of highway studies.

During the year, we initiated aerial consultant contracts for photogrammetric topographic study plans at a scale of 1" = 100' with 2' contours covering 4.18 square miles; orthophoto study plans at a scale of 1" = 100' covering 5.76 square miles; design plans at a scale of 1" = 40' with 2' contours covering 3.019 square miles; design plans with baseline profiles, construction plan and profile tracings and cross-sections, at a scale of 1" = 40' with 2' contours covering an area of 2.97 square miles; and TOPICS design plans at a scale of 1" = 20' with 1' contours covering an area of 0.69 square miles. There were ten (10) projects initiated at a total lump sum fee of \$337,613.00.

Aerial mosaics at a scale of 1" = 200', made up of existing area-wide photography, covering an area of 15.39 square miles at a lump sum fee of \$1,790.00 were initiated during the year and enlargements to a scale of 1" = 200' of area-wide photography were obtained for a total area of 14.64 square miles at a cost of \$346.50.

There were numerous visitors and telephone callers seeking both general and specific information about aerial photographic coverage of the State. Many of them were interested in our 1:7200 (1" = 600') statewide photographic coverage.

Frequent requests to loan out aerial photographs were granted to departmental personnel, departmental consultants and other State governmental agencies, and the section furnished about 1700 prints covering about 3800 square miles (2,432,000 acra).

Environmental Section

During the past year seven (7) Draft EIS's were circulated as follows:

1. Route 140, Gardner - Westminster
2. Route 52, Oxford - Auburn
3. Route 25, Wareham - Plymouth - Bourne
4. Route 128, Salem - Peabody Connector, Task "A"
5. Route 6, Dennis - Harwich - Brewster - Orleans
6. Route I-391, Chicopee - Holyoke
7. Route I-495, Taunton - Foxborough - Mansfield - Norton
Raynham - Bridgewater

Three (3) Final EIS's were approved during 1975.

1. Amherst - Hadley By-Pass
2. Route 9 @ Speen Street - Natick
3. Route I-190, Worcester - Holden - West Boylston - Sterling
Lancaster - Leominster - Fitchburg

Also 220 Environmental Assessment Forms (EAF) for the Department of Public Works were processed through the Environmental Section. The Environmental Section was involved in approximately 25 Environmental Impact Reports (EIR) as a joint participant.

The section also acts as a reviewing agency for EAF's and EIR's submitted to EOEA.

The Environmental Section conducts an inter-agency monthly meeting to discuss environmental issues of mutual concern. This meeting is primarily intended to be project and agency oriented but guest speakers also address pertinent and timely issues.

A monthly meeting is held with District Environmental Engineers and other Engineers on specific subjects, projects and problems.

For the past year the Environmental Section has had a contract with the University of Mass. providing staff support to the Department in preparation of Environmental Impact Statements and 4(f) Statements.

The Environmental staff presently consists of 14 members trained in mathematics, economy, social psychology, architecture and civil engineering. During the past year we have had two In-Service engineering interns. Also, as part of a University-Agency sponsored exchange program with Tufts University we had two students working with our staff. One member of our staff attended two semesters at Tufts University under this cooperative program.

COURSES ATTENDED

Two staff members attended a Water Quality Course sponsored by FHWA and held in Albany, New York during April, 1975.

Two staff members attended an Ecology Course sponsored by FHWA and held in Albany, New York during April, 1975.

Five staff members attended a Noise Course sponsored by NHI and held in Boston, Mass. during May, 1975.

Two staff members attended a course at Bridgewater State College on Land Use Planning.

Also we have had one member actively involved in developing a training course in Community Involvement in Highway Planning and Design for the FHWA and representing the Department as an instructor for the pilot training course.

Effective November 29, 1974, a new issuance of PPM 90-1, published as FHPM 7-7-2, provided improved guidelines in the preparation and processing of EIS's. One of the most important aspects of the guidelines being the definition of a major and non-major action.

The determination of a major action requires the preparation of an EIS or Negative Declaration. The determination of non-major action allows certain types of actions to be excluded from full EIS development.

The requirements of the Action Plan continue to be implemented and documented. The Public participation process has been refined to respond to the Action Plan and also to the new specifications for consultant services that were developed to be consistent with the Action Plan.

The Section is becoming more involved with other divisions in the Department, expanding services to include construction, highway maintenance and traffic operations.

Engineers in the sections have participated in seminars as resource-people; presented speeches to service and industry organizations; have participated as local representatives to Transportation Planning Advisory Groups and appeared before Legislative Committees on MEPA.

Special Projects

The Special Projects Section of the Bureau of Project Development functions in a staff relationship with the other sections in addition to its line function of carrying forward long-range planning alternatives. As described in the 1974 Action Plan, Project Development fills the need to eliminate redundant studies and to narrow alternative options to the most feasible and attainable solutions acceptable for Design and Construction.

During the year, the Special Projects Section negotiated and supervised contracts and studies in such diverse project areas as: bridges (new and reconstructed), carpooling, demolition, fringe parking, joint use of highway and transit facilities, area transportation studies, area parking studies, air quality assessments, acoustic impact studies, highway aesthetics, use of railroad right of way and bicycle paths.

In the field of public relations, the Special Projects Section has been a source of guidance to the student population of our local colleges, various public interest groups and public agencies in current data relation to transportation development plans and completed projects. This activity, during the year involved responses to more than 150 inquiries.

The Special Projects Staff of 6 engineers administered 30 contracts which included negotiations and contract supervision in addition to 35 in-house projects for cities and towns and other agencies.

HIGHWAY ENGINEERING DIVISION

This has been another year of change for the Highway Engineering Division. Highway design is no longer an economical analysis among safe alternate design concepts; although economic considerations are important and safety remains paramount, environmental concerns, community impact and aesthetics all play an increasingly important part in the selection process.

Major expressways on new locations still form a large part of the engineering effort, particularly geared toward completion of the Interstate System. But design emphasis in 1975 is increasingly placed on reconstruction and upgrading of existing facilities - pavement and bridge rebuilding, removal or protection from hazardous objects and the installation of the latest in safety equipment and appurtenances.

Built into our designs are a variety of measures to minimize adverse environmental impacts. Among these are flatter grades to decrease the need for winter salting, drainage systems which carry road water runoff beyond water supplies, ponds and other sites where even the slightest chloride (salt) contamination would be harmful, sedimentation basins to prevent silting of streams, noise barriers to decrease the impact of traffic on schools and residences. Also of growing concern is the impact of highway and bridge improvements on historic areas, of which there are many in our State. Every effort is made by the Highway Engineering Divi-

sion to cooperate with local communities and historical societies to insure that proposed transportation facility improvements do not conflict with historic landmarks. An example of this cooperation is the newly completed section of Route 129 in Wilmington in the area of the historic Middlesex Canal.

Again this year, safety projects are a major product of Highway Engineering; these include pedestrian fences on existing bridges, installation of break-away sign posts and impact cushioning devices at locations of hazardous immovable roadside objects. In addition, the Engineering Division is responding to the tremendous upsurge in bicycle traffic along our highways by providing for separate bicycle paths wherever feasible in our highway designs. The newly completed bicycle path in Martha's Vineyard is illustrative of our flexibility in providing safe facilities for changing trends in transportation.

With the completion of the Interstate System, safety and bridge replacement will undoubtedly be the largest components of the design program.

Bridge Section

The Department of Public Works is the owner of approximately 2400 bridges in the Commonwealth of Massachusetts. They vary in size, type, age and condition, from a stone arch built more than 200 years ago in Ipswich to a mile long structure completed a few years ago spanning the Taunton River.

In addition to the DPW owned bridges, there are 2800 bridges under the ownership of cities and towns.

A total of 491 bridges previously owned by the State's major railroads have been or are in the process of being transferred to the Department by statute. This twenty percent increase in bridges drastically accentuates a growing problem in bridge maintenance and replacement.

The problems relating to bridges have thus become a major concern of the Commonwealth.

During the annual report period extending from July 1, 1974 to June 30, 1975, the Department advertised for bids for construction, re-construction, extensions or rehabilitation of 52 bridges, 5 culverts and 3 walls.

These structures are located in 25 cities and towns throughout the Commonwealth with a total structural cost of \$20,953,000 which cost was distributed to the following categories:

Safety Programs	\$ 512,000
Urban Systems	2,814,000
Substandard Bridges	843,000
Topics	188,000
Structural Improvements	637,000
Maintenance	162,000
Chapter 90	30,000
State Highway	1,182,000
Federal Aid	<u>14,585,000</u>
	\$20,953,000

The major projects which were advertised and bids received during the current year were the following:

I-495	Recon. Chelmsford to Andover-2 bridges-	\$597,000
I-95	Recon. Boxford-Georgetown-Newbury-Newburyport-	\$7,976,000
	14 bridges-2 culverts	
I-190	Leominster-3 bridges and 2 walls	\$4,151,000

The cities and towns in which the remainder of the bridges for which bids were received are:

Acushnet	\$ 30,000	- culvert
Ashland	75,000	
Ayer-Shirley	409,000	
Boston	1,670,000	- 5 bridges
Charlton	44,000	- 2 culverts
Chelsea	33,000	- screening
Holden	67,000	- wall
Littleton	717,000	

Malden	\$1,112,000	- 2 bridges
Marlborough	95,000	
Medford	280,000	
Middleborough	63,000	- rail replacement
No. Andover	193,000	
Northfield	71,000	
Taunton	773,000	
Waltham	126,000	
Norwood-Westwood	940,000	
Revere	1,323,000	- 3 bridges
Chicopee	99,000	- 2 bridges
Auburn	26,000	
Leominster	83,000	- 5 bridges

Preliminary engineering design has been initiated for the following major projects:

Worcester	Interstate 190	- 32 bridges
Leominster	Interstate 190	- 9 bridges
Chicopee	Interstate 391	- 12 bridges
Mansfield		
Raynham	Interstate 495	- 9 bridges

The Bridge Section has been involved with the design and checking of shop drawings for various traffic sign contracts. The overhead traffic signs in various locations throughout the State that were designed or design checked by this Section cost over \$1,400,000.

The Bridge Section reviews the inspections of testing agencies and the inspection of steel fabrication plants and welding procedures.

Rating of bridges to determine the safe allowable load is one of the tasks of the Bridge Section. During this Annual Report period, 120 bridges have been rated.

Bridge Engineer, John J. Aherne, Jr., hosted a meeting of the American Association of State Highway and Transportation Officials, Region One Bridge Committee, at the Copley Plaza Hotel, on May 22nd and 23rd of this year. At this meeting proposed changes to the Standard Specifications for designing structures were reviewed and voted on.

State Aid for Communities in the Commonwealth has increased dramatically in recent years as shown in the accompanying tabulation. The current major State Aid Highway Programs for Cities and Towns are described below. (For a more complete list, please refer to the Department's blue booklet, 1975 STATE AID TO MUNICIPALITIES.)

CHAPTER 765-ACTS OF 1972:

I. This Act provided funding for the normal annual State Aid Highway allocations to all municipalities. The Department apportioned \$13.5 million for each of Fiscal Years 1975, 1976 and 1977. No matching funds are required of either the municipality or county; however, if either the municipality and/or the county wish to contribute to a project they may do so. These funds have to be used for construction, reconstruction or improvement type projects. They cannot be used for routine maintenance. This program replaces the old Chapter 81 and Chapter 90 Funding Programs, but still remains a "reimbursable" program, except on advertised contract projects where the municipalities has elected to have the Department be the Party-of-the-First Part. Projects can be constructed by Advertisement or by Force Account method. If a municipality has an approved project ready for construction or improvement, Fiscal 1976 and 1977 funds are available.

CHAPTER 497-ACTS OF 1971:

II. This Act provided for a "gas tax" distribution to all municipalities throughout the Commonwealth. These funds are estimated annually on the "Cherry Sheet" by a formula as required by Chapter 497-Acts of 1971, and as amended by Chapter 492-Acts of 1974, with actual corrected amounts distributed later on in the year. The funds have to be used for constructing, maintaining and policing city and town public ways. The Department of Public Works requires that each municipality certify annually that these funds will be used for the above mentioned purposes.

CHAPTER 1140-ACTS OF 1973:

III. This Act provided a local-aid transportation authorization to assist highway, transit and airport activities in cities and towns throughout the Commonwealth.

SECTION 16 provided for a General Fund payment of \$35 million directly to the MBTA to defray a portion of the MBTA assessments to the communities that make up said authority.

SECTION 20 provided for a \$15 million on highway bond authorization to be used for the construction, reconstruction and resurfacing of local streets to communities outside the MBTA district. These funds were received in the form of a check for highway related projects. The funds must be spent on projects which have received Department approval and must be spent by June 30, 1977.

SECTION 21 provided for a \$2.5 million highway bond authorization to the (50) MBTA "fringe" communities to be used and expended in the same manner as non-MBTA municipalities outlined under Section 20 above.

SECTION 22 provided a \$25 million direct appropriation for assistance in the operation and maintenance of local streets to communities outside the MBTA district and is intended to reimburse said communities for the cost of highway activities carried out between December 5, 1973 and June 30, 1975. These funds were distributed in the form of a check and must have been appropriated and expended by June, 1975.

CHAPTER 825--ACTS OF 1975:

IV. This Act provided a local-aid transportation authorization to assist highway and transit development in cities and towns throughout the Commonwealth.

SECTION 1 provided for a \$20 million apportionment in communities outside the MBTA district. One-half ($\frac{1}{2}$) was distributed by check in November, 1974 and the remainder in November, 1975. These funds have to be expended for highway related activities and must be spent by June 30, 1977 with notification by the community to the Department being required of said anticipated expenditure.

SECTION 3 provided for a \$25 million apportionment to communities outside the MBTA district. This is money from the General Fund and can be used for any purpose the community wishes. It was a Cherry Sheet distribution for Fiscal 1976.

SECTION 4 provided for a \$2.5 million apportionment to the fifty (50) "fringe" communities of the MBTA district to be used and expended in the same manner as in Section 1 above. These funds were also distributed and must be expended as is mentioned in Section 1 above.

SECTION 6 provided for a General Fund payment of \$45 million directly to the MBTA to defray a portion of the MBTA assessment of the communities that make up said authority.

LOCAL TRANSPORTATION AID TOTALS

(Statewide in Millions) *Estimates

Highway Aid	1971	1972	1973	1974	1975
Local Highway and including chapters 81 & 90	10.75	10.75	13.5	13.5	13.5
One cent on gasoline tax	—	31.4	23.1	23.1	23.1
Local highway aid Non-MBTA communities	—	—	—	40.0	45.0
Local highway aid MBTA fringe communities	—	—	—	2.5	2.5
Subtotal Highway Aid	10.75	42.15	36.6	79.1	84.1
Transit Aid					
MBTA	18.2	18.8	19.3	54.3	64.6
Non-MBTA	—	—	—	1.5	2.0
Subtotal Transit Aid	18.2	18.8	19.3	55.8	66.6
Total Transportation Aid	28.95	59.95	55.9	134.9	150.7

Selected Communities** (IN THOUSANDS)

Boston	8,853.9	15,128.3	14,471.3	27,902.3	31,704.3
Worcester	178.6	1,369.7	1,983.5	2,529.4	2,526.3
Springfield	161.9	1,960.8	2,380.8	2,457.2	2,450.4
New Bedford	103.2	870.0	1,066.0	1,492.1	1,490.1
Pittsfield	72.0	448.9	665.6	957.3	955.5
Fitchburg	57.1	339.6	510.4	733.6	733.2
Lowell	84.2	694.2	847.3	1,258.3	1,259.6
Cambridge	1,172.7	1,455.5	1,441.6	3,847.3	4,347.3

**Includes Transit Aid

RIGHT OF WAY BUREAURELOCATION PLANNING

The Relocation Planning Section regularly works with Department Environmental Engineers, Project Expeditors, Location and Design Personnel, as well as consultants to the Department in developing highway alignment and design alternatives to advise on certain social and economic effect of the proposed facilities, including impacts on families and businesses to be displaced, employment and tax loss, effects of business displacement, possible disruption to neighborhoods and local trade, and the relocation of established families and businesses. Over 60 projects were actively worked on during Fiscal Year 1975. In addition Conceptual Stage Relocation Plans were prepared for 24 projects which could have involved the displacement of as many as 600 families and 150 businesses in the various alternatives. Right of Way Stage Relocation Plans were prepared for 8 projects and 21 Right of Way Stage Relocation Plans were developed for submission with requests for hardship acquisitions.

PROJECTS

During Fiscal Year 1975, the Right of Way Bureau Project Section worked on some 519 cases, involving about 54 cities and towns. The work that is carried out by the Project Section includes the establishment of property ownership, securing real estate tax assessments, conducting property interviews with owners and tenants, preparing property reports, and investigating complaints such as reports from abutting property owners of contamination to their wells from road construction activities.

Land and easement takings were made in connection with Interstate, ABC, Safety, Topics and Urban Systems Projects. Real Estate takings were also made with respect for maintenance sites, rest areas, drainage betterments, construction, drainage and other types of easements.

The Right of Way Project Section also monitored Right of Way acquisition by cities and towns in connection with Federally-aided Urban Systems Projects. By reviewing procedures of municipal taking agencies, it stood in the position of being able to certify to the Federal Highway Administration that acquisition, appraisal and relocation procedures were carried out in compliance with Title II and/or Title III, Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970.

TITLES

As a direct result of the Highway projects for Fiscal Year 1975, it was necessary to obtain Title Examinations on 285 properties. It was further required that 478 Title Rundowns be made on properties involved in land takings.

APPRAISALS AND APPRAISAL REVIEW

During 1975 Fiscal Year, 330 Staff Appraisals were prepared and 111 Fee Appraisals secured. In addition, the lease value of State-owned land was determined on five properties. The Appraisal Review Section made 410 reviews of cases for the Right of Way Bureau during Fiscal Year 1975.

The 410 cases are broken down into the following categories:

Projects, 263 cases; Advance Acquisitions, 31 cases; and Miscellaneous, 116 cases.

The miscellaneous category includes re-reviews, sales of excess land and leasing of State-owned land.

In addition economic rentals were established in 104 cases, broken down as follows: 26 single family units, 73 apartment units and 5 business units.

REAL ESTATE REVIEW BOARD

The Massachusetts Real Estate Review Board reviewed 206 appraisals and established an acquisition value on 131 properties. The Board also determined a value on 33 residential dwellings that are to be reconveyed by the

Commonwealth in Lynn and Saugus which were acquired for I-95 North and 13 properties in Boston taken for I-95 South. The five member Board also set a rental value on five parcels of land to be leased by the Commonwealth.

NEGOTIATIONS

The Negotiation Section made fair market value offers in 493 cases. This section also rendered assistance to the Land Damage Section which processed 318 payments to property owners during the Fiscal Year. In 70 cases, a final settlement was obtained from the property owners.

Furthermore, the Negotiation Section mainly by personal contact at payment sessions advised 103 owner-occupants and tenants of their Replacement Housing supplements and Rental Replacement Housing additive amounts.

In addition, the Negotiation Section was involved in the obtaining of pro tanto receipts and releases for the purpose of processing unpaid checks for payment. A total of 67 pro tanto receipts and releases were obtained during the past Fiscal Year.

The Negotiation Section also processed 30 of the 60 claims for damages incurred to structures adjoining I-93 in Somerville as the result of construction work on the highway.

RELOCATION

Replacement housing additives were computed for 90 residential owner-occupied families and Rent Supplement additives were computed for 78 residential occupants.

During Fiscal Year 1975, land takings affected 128 families and 4 businesses and in this period, 60 families were relocated and 14 businesses moved to new quarters.

There were 127 moving cost claims, both residential and business which were processed during the Fiscal Year involving a total amount of \$113,955. replacement housing allowance claims totalling \$293,218 (average \$3,258), 78 rent supplement claims totalling \$231,015 (average \$2,937), and 86 dislocation allowance claims totalling \$16,000 (average \$190). A total of 392 business and residential relocation claims were processed in Fiscal Year 1975, and the total family and business relocation cost was \$751,223.

Relocation services rendered by the Boston Redevelopment Authority and the Worcester Redevelopment Authority as Contract Agents reflected a fiscal outlay of \$92,517.

Pursuant to the provisions of the 1970 Uniform Relocation Act, Right of Way personnel prepared the relocation plans at Right of Way stage for all projects which went out to bid. Under this law relocation assistance has been given very high priority and added emphasis and these legal requirements have resulted in an upgraded relocation section consisting of 25 Department relocation staff workers which, together with personnel from the Boston Redevelopment Authority and the Worcester Redevelopment Authority have ably and successfully carried out the relocation responsibilities of the Department in this period.

ADVANCE ACQUISITION and FUNCTIONAL REPLACEMENTS

The Advance Acquisition Section processed 30 cases for acquisition in the Fiscal Year just ended.

These cases included large residential tracts that had received or were to receive municipal subdivisional approval and by advance acquisition avoided the possibility of hardship to families and high acquisition costs to the public. Work on one functional replacement structure, a school was commenced in the City of Worcester. Three other parcels of vacant land and twenty-three residential

properties which were requested by the owners, were the subject of takings.

There are twenty-seven cases now pending in various stages of completion, among which are four additional requests which may involve functional replacement. The functional replacement program began during this past Fiscal Year and included a City-owned school which was acquired July, 1974, a Registry of Motor Vehicles Building, a Municipal Airport, a City-owned swimming pool and State Police Barracks. If all these cases should be approved, it could result in over \$2 million of additional Federal funds being authorized for distribution to the various public agencies that own and control these facilities.

During this past Fiscal Year an estimated total amount of \$1,485,500 for land damages was authorized for 34 parcels from 30 owners.

PROPERTY MANAGEMENT

Property Management activities of the Bureau were extensive during Fiscal Year 1975, as can be seen from the following figures:

During the Fiscal Year 1975, rentals under the Property Management Section of the Right of Way Bureau grossed \$305,297 with a net income after expenses of \$186,842.

Property Management income for the year 1975, in comparison to 1974, revealed the following:

	<u>Fiscal 1975</u>	<u>Fiscal 1974</u>
Grossed Rental Income	\$305,297	\$317,096
Net Income After Expenses	186,842	148,096
Sales of Structures	52,872	11,707
Sales of Land	2,800	20,500
Parking Area Leases	1,053	8,860
Additional Leases	193,263	132,100

	<u>Fiscal 1975</u>	<u>Fiscal 1974</u>
Total Net Income	\$436,830	\$321,264

During the year, 59 structures were acquired of which 58 were residential and 1 was commercial.

During the same year, 57 were vacated and 49 structures were released for demolition.

FHWA LIAISON

The Bureau's Federal Highway Administration Liaison and Compliance Section, during the Fiscal Year 1975, submitted documentation to support reclaims in connection with F.H.W.A, audit deductions and the Federal-Aid Pre-Audit Ineligibility Findings against appraisal and reloaction citations. This effort made it possible for the Bureau to recover \$703,497 which was previously withheld by F.H.W.A.

The Bureau at the present time has submitted documentation to the F.H.W.A. that should release an additional \$345,000.

ATTORNEY GENERAL LIAISON

The following represents the activities of the Attorney General Liaison Section, Right of Way Bureau, Department of Public Works, for the Fiscal Year 1975.

The number of cases requested by the Department of the Attorney General totalled 165. The number of cases completed by the Department of the Attorney General and returned to the Department totalled 125. This section provided assistance in preparation of each of these cases for trial or settlement.

Additionally, this section provided legal advisory assistance to various Divisions and Sections of the Department.

This section also prepared 19 legislative bills which were introduced and heard by the 1974-1975, legislature. There were approximately 55 other bills for which the section prepared written reports and appeared before legislative committee hearings on 20 bills.

TRAINING

During Fiscal Year 1975, the Right of Way Bureau's training program permitted 85 of our personnel to participate in courses of training. The breakdown is as follows:

Thirty-three (33) attended and graduated from the Right of Way Institute, Suffolk University, Boston, Massachusetts, where they participated in a Graduate Course Three in Highway Engineering, Transportation Planning and Environmental Law. Upon successful completion of this course, which was recommended by the Federal Highway Administration (FHWA), by special notice, these 33 of our personnel were awarded the professional designation of "Real Estate Eminent Domain Analyst" by the University.

Eight (8) of our new personnel were put through the special eight week training course as required under Schedule B.

Forty-four (44) attended a special seminar given on Relocation Assistance at the Arlington District Office, which was conducted jointly with the personnel of the F.H.W.A.

OUTDOOR ADVERTISING SIGN CONTROL

The activities of this section are in compliance with the Federal Highway Beautification Act of 1965, and include the following responsibilities:
Preparation of inventory of all signs located on Interstate and Federal Aid roads for determination of legal and illegal signs; preparing notices for all

illegal signs; reviewing all applications to the Outdoor Advertising Board for permits to determine if they meet F.H.W.A, criteria; and appearing at Public Hearings of the Outdoor Advertising Board regarding legality of sign locations.

As a result of the work of this section, during Fiscal Year 1975, there were 2,289 signs removed throughout the State.

In addition to the removal of signs this section has recently been given the additional responsibility to initiate a Junk Yard Screening Program throughout the State.

HIGHWAY CONSTRUCTION DIVISION

The Construction Section of the Department of Public Works supervised the inspection of an additional 77.5 miles of highway construction and related work awarded during the 1975 fiscal year. This amounted in value to more than \$92,500,000.00.

The Department continues its policy of strict adherence to State and Federal Environmental and anti-pollution regulations.

Construction project accidents continue to decline in number because of the recent enactment of the Federal Safety Act (OSHA).

The Price Adjustment Clause for bituminous mixtures due to the escalation of the price of asphalt established in the Spring of 1974 is still in effect, and St. 1974, c.554 to adjust the price of liquid asphalt in contracts awarded on or before December 31, 1973 has been implemented and is fully operative.

Once again the Construction Section conducted Seminars in the District Offices to iron out any problems that might arise on projects, and to inform Construction personnel of the latest methods and procedures.

A summary of the various categories of projects follows:

	<u>MILES</u>	<u>AMOUNT</u>
Interstate	77.5	68,363,594.00
Primary, Secondary and Urban	29.0	22,710,264.39
Non Federal Aid	3.5	1,535,087.38
	<u>110.0</u>	<u>92,608,945.77</u>

PROJECTS AWARDED DURING FISCAL 1975

INTERSTATE

I-91

Holyoke-Easthampton- Northampton #17975	Fencing 6.2. Miles	\$314,675.00
West Springfield- Holyoke #18176	Safety	36,909.00
Northampton #17973	Fencing	159,082.00
Springfield #17888	Roadside Development 6.2. Miles	<u>89,336.35</u> \$600,002.35

I-93

Medford-Reading #18329	Roadside Development 7.3 Miles	162,463.00
Reading-Methuen #17979	Safety 7.3 Miles	<u>257,284.75</u> \$419,747.75

I-95

Boston #18159	Demolition	25,997.00
Boston #18160	Demolition	32,696.75
Boston #18013	Demolition	2,399.00
Boxford-Rowley- Georgetown #18027	Reconstruction 5.7 Miles	18,748,067.40
Georgetown-Newbury- W.Newbury #18124	Reconstruction 4.1 Miles	11,566,875.00
Newburyport #18002	Reconstruction 2.8 Miles	8,836,662.40
Attleboro-Canton #18099	Call Boxes 12.6 Miles	<u>473,866.00</u> \$39,686,563.55

I-190

Leominster #18416	Resurfacing 1.7 Miles	7,066,158.00
Worcester #18044	Construction 1.0 Miles	1,457,480.00
	2.7 Miles	<u>8,523,638.00</u>

I-195

Fairhaven-Mattapoisett #18197	Roadside Development	138,026.50
Fairhaven-Mattapoisett #18269	Bridge Screening	65,080.00
Mattapoisett-Marion #17913	Roadside Development 3.4 Miles	173,740.00
Wareham #17972	Roadside Development 2.5 Miles	249,490.50
Marion-Wareham #17955	<u>Roadside Development</u> 5.9 Miles	<u>228,653.00</u> 859,989.50

I-290

Shrewsbury-Boylston- Northborough-Marlborough #18407	9.3 Miles Construction	3,069,499.70
Northborough-Marlborough #17997	Fencing	162,960.00
Worcester #18340	Resurfacing 2.2 Miles	1,049,448.40
Auburn-Worcester #17974	<u>Fencing</u> 11.5 Miles	<u>106,825.00</u> 4,388,733.10

I-391

Chicopee-Holyoke #18156	Demolition	4,557.00
Chicopee-Holyoke #18011	Demolition	<u>23,822.50</u> 28,379.50

I-495

Amesbury #18263	Dredging and Riprap	38,035.00
Franklin-Bellingham- Medway-Milford #18230	Fencing	154,010.00
Marlborough-Hudson- Berlin-Bolton #18412	Fencing 5.1 Miles	180,612.50
Bolton #18410	Reconstruction 4.4 Miles	3,985,097.25
Bolton-Harvard #18411	Fencing 3.5 Miles	119,545.00

Harvard-Boxborough #18409	Reconstruction 5.0 Miles	4,308,469.25
Chelmsford-Lowell #17994	Safety	99,741.00
Chelmsford-Lowell- Tewksbury #17876	Resurfacing	1,760,553.00
Foxborough-Plainville- Wrentham #18195	Fencing 0.7 Miles	147,299.00
Wrentham-Franklin #18222	Fencing	198,544.75
Milford-Hopkinton #18268	Fencing 5.0 Miles	190,855.00
Hopkinton-Westborough #18270	Fencing 5.1 Miles	182,443.50
Westborough-Marlborough #18322	Fencing	178,062.50
Longmeadow-Bernardston #18003	Call Boxes	977,511.50
Chelmsford #17952	Resurfacing 3.5 Miles	1,335,761.00
	32.3 Miles	<u>13,856,540.25</u>

PRIMARY, SECONDARY & URBAN

	<u>Route 1</u>	
Attleboro-Plainville- Wrentham-Foxborough #18177	Fencing 16.0 Miles	282,324.50
North Attleborough #18318	Reconstruction 1.0 Miles	620,782.60
	17.0 Miles	<u>903,107.10</u>
	<u>Route 2</u>	
Gardner-Acton #18070	Safety	347,170.00
Concord #17969	Reconstruction	1,423,345.00
Ayer-Shirley #18181	Reconstruction	<u>699,797.23</u>
		2,470,312.23
	<u>Route 2A</u>	
Littleton #18283	Bridge Construction	933,864.35

	<u>Route 6</u>	
Somerset #18105	Roadside Development	103,144.20
	<u>Route 9</u>	
Amherst-Hadley #18221	Safety 1.5 Miles	1,617.367.20
	<u>Route 20</u>	
Dalton #18196	Safety	49,330.00
Lee #18157	High Hazard Location	99,229.50
Lee-Becket #17976	Safety 5.6 Miles	149,313.50
Westfield #18085	Safety	<u>71,008.75</u>
	5.6 Miles	368,881.75
	<u>Route 28</u>	
Yarmouth #18332	Topics	164,519.00
Bourne #18341	Parking Area	<u>216,225.65</u>
		380,744.65
	<u>Route 44</u>	
Seekonk #18337		75,767.00
Taunton #18200	Construction 1.0 Miles	1,034,175.20
		<u>1,109,942.20</u>
	<u>Route 52</u>	
Auburn-Oxford #18057	Demolition	9,250.00
	<u>Route 97</u>	
Haverhill #17859	Traffic Control	996,257.50
	<u>Route 110</u>	
Methuen #17873	Drainage	9,316.00
	<u>Route 143</u>	
Chesterfield #18179	Demolition	985.00

	<u>Route 202</u>	
South Hadley #18263	Reconstruction 1.0 Miles	111,592.75
Holyoke #18356	Safety 0.6 Miles	459,624.75
	1.6 Miles	<u>571,217.50</u>
	<u>Atlantic Avenue</u>	
Boston #18232	Landscaping	104,272.00
	<u>10 Streets</u>	
Boston 18267	Historical Signs	17,374.00
	<u>Bowdoin & Somerset Sts.</u>	
Boston #18417	Reconstruction	367,992.00
	<u>Washington & Union Sts.</u>	
Braintree #17928	Traffic Control	436,614.00
	<u>Washington & Walnut Sts.</u>	
Brookline #17857	Reconstruction	394,363.45
	<u>Everett Ave.</u>	
Chelsea #17998	Reconstruction	82,225.00
	<u>7 Locations</u>	
Southbridge #17820	Topics	190,555.00
	<u>6 Locations</u>	
Springfield #17888	Topics	246,687.61
	<u>Bicentennial</u>	
Statewide #18120	Information Signs	117,628.40
	<u>Hydro Cells</u>	
Statewide #18198	Safety	391,700.00

	<u>North St.</u>	
Boston #17887	Relocation	2,009,076.00
	<u>High Street</u>	
Danvers #17859	Topics	692,733.45
	<u>Bicycle Path</u>	
Edgartown #18056	1.86 Miles	233,548.50
	<u>15 Locations</u>	
Fitchburg #18028	Topics	1,039,778.75
	<u>6 Locations</u>	
Holden #18007	Topics	466,187.50
	<u>Medford St.</u>	
Malden #17971	Bridge Reconstr.	977,747.00
	<u>5 Locations</u>	
Milford #18289	Topics	249,905.10
	<u>14 Locations</u>	
Needham #18012	Topics	344,794.00
	<u>Cove Road</u>	
New Bedford #17843	Reconstruction	345,391.50
	<u>2 Locations</u>	
North Andover #18312	Topics	576,579.10
	<u>Route 125</u>	
North Andover #18087	Pedestrian Overpass	245,640.50
	<u>Messenger & George Sts.</u>	
Plainville- No.Andover #18319	Reconstruction 1.0 Miles	529,762.37

	<u>Bicycle Path</u>	
Oak Bluffs #18086	Construction 2.4 Miles	367,993.30
	<u>Union Street</u>	
Rockland #18119	High Hazard Location	60,210.50
	<u>5 Locations</u>	
Saugus #18257	Topics	196,392.80
	<u>13 Locations</u>	
Somerville #17995	Topics	549,960.00
	<u>8 Locations</u>	
Somerville #18072	Topics	378,875.00
	<u>R.R. Crossings</u>	
Districts 1 & 2 #18227	Safety	420,833.00
	<u>R.R. Crossings</u>	
Districts 3 & 4 #18228	Safety	476,253.66
	<u>R.R. Crossings</u>	
Districts 5 & 8 #18229	Safety	334,368.00
	<u>R.R. Crossings</u>	
Districts 6 & 7 #18226	Safety	390,433.20

NON FEDERAL AID

	<u>10 Streets</u>	
Auburn #18069	Sewer Repairs	47,911.64
	<u>N.E. Expressway</u>	
Chelsea #18321	Bridge Screening	50,550.00

	<u>Ashley Ave.</u>	
Chicopee-W.Springfield #17880	Bridge Reconstr.	27,540.00
	<u>Route 22</u>	
District 3 #18029	Catch Basin Grate Alterations	8,142.46
	<u>Various State Highways</u>	
District 5 #17885	Catch Basin Grate Alterations	4,590.69
	<u>52 Locations</u>	
District 6 #18046	Catch Basin Alterations	3,204.24
	<u>20 Locations</u>	
District 7 #17871	Catch Basin Alterations	4,465.50
	<u>Route 113 & 38</u>	
Dracut #18071	Resurfacing 2.5 Miles	394,884.00
	<u>Route 3A</u>	
Duxbury #18231	Safety	40,333.60
	<u>I-195</u>	
Somerset-Fall River- New Bedford #18021	Lighting	202,464.00
	<u>Route 43</u>	
Hancock #18104	Planting	24,555.00
	<u>Route 53</u>	
Hanover #17930	Safety 0.5 Miles	65,854.50
	<u>Route 139</u>	
Hanover #17997	Safety 0.3 Miles	43,583.00

	<u>Route 2</u>	
Lincoln #18199	Demolition	3,175.00
	<u>Route 129</u>	
Lynn #18180	Safety	21,850.00
	<u>Route 27</u>	
Brockton #17962	Traffic Control	22,969.50
	<u>Route 18</u>	
Abington #17917	Safety	75,188.00
	<u>Route 132</u>	
Barnstable #17954	Parking Area	29,955.75
	<u>Deerfield River</u>	
Monroe-Rowe #17879	Bridge Reconstruction	126,766.00
	<u>Routes 202 & 122</u>	
New Salem #18073	Safety	19,359.00
	<u>Prospect Street</u>	
Waltham #17953	Reconstruction 0.2 Miles	237,035.50

Contract Engineering

The Contract Engineer's Section processes the bids for Federal Aid Projects requiring F.H.W.A. concurrence, State Highway Construction Projects, Chapter 90 Projects, Maintenance Projects, Waterways Projects, Boring Projects, projects for the construction, reconstruction, alteration, remodeling, repair, or demolition of buildings under the provisions of General Laws, Chapter 149, and Right of Way Projects involving the sale of houses, and the leasing of State-owned property, from bid opening to award of contract and maintains all the necessary records thereof. The Prequalification and post-qualification of contractors is administered by this Section and the issuance of Proposal Forms and plans to prospective bidders requires the approval of this Section. Force account agreements with public utilities, cities and towns are reviewed for approval.

MAJOR ACTIVITIES

1. At bid openings all proposals are publicly opened and read subject to verification for arithmetical correctness, examination for informalities and compliance with applicable statutes.

2. After a bid opening all proposals are immediately checked for compliance with requirements. Proposals that are unacceptable due to incompleteness, irregularities, collusion, qualifying clauses, etc., are duly noted and if the deviation is a matter of substance that is prejudicial to the rights of other bidders a recommendation for rejection of such bid is made; on the other hand, a deviation may be merely a matter of form or some immaterial variation from the exact requirements that can be waived by the Commission under the right

MAJOR ACTIVITIES (CONT'D)

reserved. In the latter instance, if such bid is the lowest bid submitted, a recommendation will be made that the informality be waived and the project awarded to the low bidder as being in the best interest of the Department. After all bids have been checked and verified a "Summary of Bids" is prepared, printed and collated for distribution to interested Sections, Divisions, District of the Department, contractors who bid on the particular project, and local trade magazines and publications. Copies are retained for the Section's Records.

3. Letters recommending award or rejection are prepared and typed by this Section for the Chief Engineer's signature for presentation to the Board. Such letters are routed to our Fiscal Section for an assignment of funds. For work involving Federal funds, letters are also prepared and typed for the Chief Engineer's signature, requesting F.H.W.A. concurrence in the award or rejection of contracts as required by federal regulations.

4. Prequalification Statements submitted by contractors as required by General Laws, Chapter 29, Section 8B are analyzed, computed, and a rating determined for submission to our Prequalification Committee. Performance records of contractors who have previously performed work for this Department are maintained in this Section, and are designed to provide facts and documented data on every completed project and the contractor's performance. Such records provide a source of information for recommendations made by the Contract Engineer

MAJOR ACTIVITIES (CONT'D)

to the Prequalification Committee for the determination of Pre-qualification Ratings or limitations warranted by the facts.

5. For projects for which prequalification is not required, the low bidder and/or the lowest responsible bidder must submit a post-qualification statement, duly signed and sworn to, outlining his experience, equipment and financial resources on forms supplied by this Department. These post-qualifications statements are computed and analyzed exclusively by this Section and on the basis of the computation and analysis a recommendation for award or rejection is made to the Board.

6. Since the enactment of the Prequalification Statutes all requests for Proposals and Plans for bidding purposes have to be cleared and approved by this Section. This policy was adopted so as to prevent the issuance of Proposals and Plans to contractors who are ineligible to bid because of failure to meet the requirements of the Prequalification Statute and Regulations.

7. Records of all activities of this Section are maintained for purposes of documentation and source of information.

(a) A complete alphabetical file of all contractors who have performed work for this Department is kept current at all times. This file shows the location of each project which the contract has performed, the advertising date, bid opening date, bid amount, date of award, and starting and completion dates.

(b) A card index file for each project awarded, showing date of advertising, opening of bids, date of award, office

MAJOR ACTIVITIES (CONT'D)

estimate, bid price, contractor's name and address, contractor's qualification, start of construction, date of completion, extensions of time, if any, and contractor's performance record.

(c) A card file of projects awarded in each city or town, showing name of contractor, type of project, and the starting and completion date of all contracts performed within the city or town.

(d) Prequalified contractors, their prequalification rating and date of expiration.

(e) A list of "Active Bidding Contractors" who submit bids for any project for this Department each calendar year is prepared and maintained.

CONTRACT ENGINEER SECTION

PROJECTS AWARDED FOR FISCAL YEAR ENDING JUNE 30, 1975

<u>NUMBER</u>	<u>CATEGORY</u>	<u>AMOUNT</u>
87	FEDERAL AID	\$ 90,944,865.23
35	STATE HIGHWAY CONSTRUCTION	3,568,847.95
23	CHAPTER 90	4,833,830.90
293	MAINTENANCE	16,937,088.44
14	WATERWAYS	1,782,214.00
452	TOTAL	\$ 118,066,846.52

DURING THE FISCAL YEAR JULY 1, 1974 TO JUNE 30, 1975 A TOTAL OF 415 CONTRACTORS WERE PREQUALIFIED.

Final Review Section

The Final Review Section assumes the responsibility of assuring the Federal Highway Administration, the Department, cities and towns and the contractors that quantities for payment are correct and equitable.

The processing of projects encompasses the checking and reviewing of all field data recorded in survey books, pile driving books, manifold books and quantity control ledgers to ascertain that all calculations, engineering and accounting, are proper and correct. The interpretation of the Special Provisions as a complement to the Standard Special Provisions determines the limitation of payments for each and every project. The project checking includes the analysis of survey notes and plotting of the same in order to obtain quantities for every conceivable item of excavation as well as fill areas by mechanical means. Recently the computer has been utilized for checking these quantities when possible and has enabled this section to expedite projects with added accuracy. Projects that appear to lack the required data or may be inconsistent, necessitate a meeting with the Resident Engineer and/or his supervisor or assistants.

The initiation of pre-final teams which operate in the field at the time of the construction of said project has proven beneficial to the District, the Resident Engineer and this

Section. It makes available immediate answers resulting in quickly resolving any discrepancies which may exist. It also makes possible recommendations as to format by representatives of this Section prior to final entries.

This section is subject to audits by the Federal Highway Administration and State Auditors and the utmost cooperation is rendered them.

The following is a breakdown of the values of various types of contracts processed by the Final Review Section during the period from July 1, 1974 to June 30, 1975.

BREAKDOWN VALUE OF CONTRACTS PROCESSED BY THE FINAL
REVIEW SECTION

VALUE OF STATE HIGHWAY CONSTRUCTION CONTRACTS:

HAVING FEDERAL AID PARTICIPATION

State Highway Construction	\$58,980,416.27
Maintenance	103,466.07

VALUE OF STATE HIGHWAY CONSTRUCTION CONTRACTS:

NON-FEDERAL AID	\$ 6,438,982.49
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<u>VALUE OF STATE AID (Chapter 90) CONTRACTS:</u>	\$ 4,641,253.37
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<u>VALUE OF MAINTENANCE CONTRACTS:</u>	\$17,053,420.73
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<u>VALUE OF MISCELLANEOUS CONTRACTS:</u>	\$ 231,769.15
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(Includes Consultant Services, Boring Contracts, Boston - (P.W.B. Contracts), Traffic, etc.)

Total = \$87,449,308.08

NOTE:

Not included in the above totals are thirteen (13) Federal Estimates (Final Federal Aid Vouchers) which were submitted during the period of July 1974 through June 1975

HIGHWAY MAINTENANCE DIVISION

Physical maintenance consists of preservation and restoration of the highway and its attendant facilities. Betterments include improvements and additions to the highway as originally constructed. Physical maintenance and betterment projects are carried out both by using Department forces and by contract.

The Maintenance Section in the Fiscal Year 1975 completed 341 contracts for various types of work such as roadside maintenance, traffic maintenance, snow and ice control, bridge and highway maintenance.

No funds were appropriated for the regular resurfacing account for Fiscal Year 1975. However, \$7,000,000.00 was expended from the Accelerated Highway Program. A total of fifty one (51) contracts were awarded during the year for the resurfacing of approximately one hundred and ten (110) miles of highway with Class I Bituminous Concrete Type I-1, varying in widths from 24 feet to over 60 feet and varying in depth from 3/4" to 3".

The Permit Unit issued some 19,981 permits for the movement of heavy equipment, house trailers, buildings and other irreducible loads, for 302 utilities installations and 100 driveway construction permits.

The Maps and Statistics Unit of the Maintenance Section maintained and continually updated maps, charts, and statistical records relative to the operation of the state highway system in Massachusetts.

Activities carried out under Roadside Maintenance included the removal of dead, diseased and dangerous trees, mist blower spraying, soil sterilant spraying, tree planting, tree trimming, travel trash collection, mowing of grass, roadside spraying and fertilization, drainage ditch spraying, tree planting for erosion control, selective clearing for safety and sight distance and plant fertilization. Normal force account work such as vista clearing, selective clearing and trimming, brush control for safe sight distance, emergency tree removal and trimming along with costly litter pick up, rest area and truck turnout improvement and drainage ditch clearance were carried out in all Districts.

As of July 1, 1975 the Structures Maintenance Unit had responsibility for a total of 2,313 bridges. The cleaning and painting of bridges was one of the most important operations. During Fiscal Year 1975 contracts were awarded for the cleaning and painting of 11 bridges at a total cost of \$522,755.00.

The Underwater Bridge Inspection Team has proven to be a useful adjunct to the Maintenance Section in meeting the Department's legislated obligation of inspecting all bridges on the Federal Aid System at least once every two years. Approximately 80 underwater bridge inspections have been conducted. The services of the team are available to all units in the Department. Routine, preliminary and final inspections have been made for the Waterways Division, Bridge Section, Construction Section and Survey Section.

There have been some rather revolutionary life saving devices introduced in the past few years. These safety devices were taken advantage of by the Traffic Maintenance Unit and they included breakaway sign supports, impact attenuation devices, rapid curing pavement markings, optically programmed signals and new design standards.

The budgetary allotment for pavement markings maintenance for fiscal 1975 was increased \$300,000.00 over fiscal 1974 for a total of \$1,135,000.00 to purchase materials and to do contract maintenance work. In effect, this money allowed the Department to purchase striping. This funding, although not enough to apply material to every stripe requiring it, was responsible and did provide for an adequate striping program for fiscal 1975.

During the 1975 Fiscal Year, the Department Snow & Ice Control forces plowed and treated 11,438 lane miles of state highway. The program for providing industrially pre-mixed sodium and calcium chloride was continued again this year. Also the construction of Chemical Storage Sheds was continued with an appropriation of another \$300,000.00 from the Legislature. A proposal was advertised for the contract construction of thirteen (13) sheds varying in length from sixty (60) to ninety six (96) feet, each being forty (40) feet in width. Last winter can best be characterized as moderate, but the almost continuous sequence of smaller storms (58 average statewide), with a high frequency of freezing and thawing cycles, plagued the highway crews and motorists. Storms caused no extensive tie-ups but were of the size and low-temperature variety that required a high personnel work outlay, and must be classified as expensive.

BUREAU OF TRAFFIC OPERATIONS

The role of Traffic Engineering in the safe and efficient operation of our state and local highway systems today is highly significant. Traffic control and safety devices have proven themselves a necessary adjunct to the modern highway.

Bureau operations and priorities were profoundly influenced by the economic climate in Fiscal 1975 with the Bureau's focus being shifted to conservation of monetary and energy resources. Principal areas receiving attention were speed regulation, highway lighting, motorist communications and peripheral programs.

The Department's lighting section has initiated a program of energy conservation by lamp type replacement. Mercury vapor lamps in existing lighting systems have been and are continuing to be, replaced with high pressure sodium vapor lamps. The savings in energy has been approximately thirty-seven percent (37%) over the average life of each lamp. This factor multiplied by the life of each lighting system yields a significant savings and has justified introduction of this lamp type.

The Speed Regulation Unit has, for the past year, had the responsibility of monitoring vehicular speeds on our state highways both for the Department and Federal Highway Administration. The purpose of the study has been to ascertain the average speed, median speed, and 85th percentile speed of motorists. The study also indicates the percent of motorists exceeding 55, 60 and 65 miles per hour. A report will be submitted quarterly to the F.H.W.A.

The basic purpose for the speed reduction to 55 miles per hour has been to reduce oil products consumption. Another benefit has been a reduction in accidents over the period of specific enforcement. Significant progress was made in the design and installation of Motorists Aid Call Box Systems. Installation of the Route I-93 and Route I-91 Systems was begun during Fiscal 1975 along with Routes I-495 from Foxborough to Milford and I-95 from Attleboro to Canton.

These four systems, when completed, will bring the total Motorist Aid Call Box System mileage on our Interstate Highways, to an aggregate of 200 miles.

During Fiscal 1975 the TOPICS Unit, using Urban System funds, submitted 173 Area-wide work programs and budgets. There have been 275 requests for field topographic surveys for new projects submitted along with 125 - 75% preliminary project design plans. Plans, Estimates and Special Provisions have been prepared for 104 projects with a construction dollar volume of \$46,000,000.

The Traffic Signal Section processed 75 federally aided signal layouts and 225 signal layouts for cities and towns.

During Fiscal 1975 the main workload of the Traffic Engineering Signs and Pavement Markings Unit was channeled in four specific areas - Signing, Pavement Markings, Standards and Specifications and Route Changes and Descriptions.

The Sign Unit has the continuing responsibility of reviewing the signing for Department (Highway Design) and consultant projects along with the implementation of our own sign projects. This past year the unit reviewed twenty (20) advertised interstate and state highway contracts containing approximately \$4,000,000 in signing. The unit also reviewed signing for forty (40) Safety Improvement (High Hazard Location) projects advertised during Fiscal 1975.

Three special sign projects - The Street Name Sign Program, the Massachusetts Information Signs in Roadside Rest Areas and the Installation of Traffic Control Devices at Railroad Crossings have also been undertaken by this unit.

The primary objective of the Street Name Sign Program is the prevention of accidents by providing concise and adequate signing at street intersections for the stranger in order that he may readily find his desired destination without causing disruptions in the traffic stream. It was implemented in November, 1974 with Phase I of a two phase program. It was intended that forty-six (46) cities and towns within the Route 128 periphery plus eleven (11) cities and towns chosen by the Bicentennial Commission outside Route 128 would participate in this program. However, only thirty-three (33) cities and towns responded and as a result the Department supplied 10,103 street name signs. The signs were installed by local forces on those numbered routes within the community.

The Massachusetts Information Signs in Rest Areas program was initially slated to be the Department's contribution to the Bicentennial celebration. This consists of erecting special porcelain-enamel steel information maps in roadside areas across the Commonwealth. Its main purpose is to increase operational efficiency and improve safety by directing tourists to their destination without causing disruption in the traffic stream.

The installation of Traffic Control Devices at Railroad Crossings consists of the application of white and yellow reflectorized pavement markings and the installation of warning and regulatory signs at nine hundred and seventy-six (976) railroad crossings statewide under four separate contracts each containing two Districts. The funding for this project is under Section 203 (Rail-Highway Crossings) and Section 230 (Federal-Aid Safer Roads Demonstration Program) of the Highway Safety Act of 1973. Cost for this project totaled \$1,665,687.80.

During the past year the Pavement Markings Sub-Unit has reviewed a multitude of projects designed by consultants and Department personnel. These were designed according to the latest standards set forth by Massachusetts Manual on Uniform Traffic Control Devices for Streets and Highways. Thermoplastic markings are being used where traffic volumes warrant them.

The Sign Unit submits to the Federal Highway Administration in Washington, D.C. new concepts and prototypes in signing for

acceptance by the National Joint Committee. This past year two submissions were made. The first was the use of a new graphic sign for the exclusion of pedestrians, bicycles and horses from limited access highways. One sign incorporating three symbols of a person, bicycle and horse with a red circle and red diagonal slash superimposed on them. The second submission was a graphic Bus Stop sign containing the symbol of a bus, a large "T" and round top. To date these submissions are pending review by the National Joint Committee.

The Operations and Safety Unit performed geometric reviews, traffic analyses, inspection of traffic controls and devices through construction projects, processing Chapter 90-33B projects and in maintaining the Department's accident records system. A recent innovation in the Accident Records System is the capability of producing collision diagrams on a computer controlled plotter for all State Highway intersections.

Funds provided by Section 205, under the Highway Act of 1973 have been completely obligated for pavement marking on highways which are on and off the Federal Aid System. To date approximately 300 miles of highways have been marked under this program.

The Department has determined, under Section 210 of the Act that the replacement of conventional fixed sign supports with the safer breakaway type is of the highest priority in the effort to eliminate roadside obstacles. Last year a contract for approximately one and one-half million dollars was let to remove fixed sign supports on state highways. An equal amount of funds are expected to be obligated this year.

Since Section 230 encompasses all of the aforementioned programs, but differs in that funding is eligible only for highways which are not on the Federal-Aid System, the type of work done is quite varied. Under Section 230 several projects are presently being designed by cities and towns for funding.

The Bureau of Traffic Operations administers three (3) of the eighteen (18) Highway Safety Standards which comprise the Governor's Highway Safety Program. Examples of accomplishments under these standards are as follows:

- A. Utilizing funds provided by Standard 609 the Department hired an additional engineer to aid in administering Federal-Aid Programs such as the Highway Safety Act of 1973.
- B. The Department's Photologging Unit is also funded through through this standard. To date photologging has proven to be highly valuable in locating roadside obstacles and examining accident locations.

Standard 612 has enabled the Department to continue programs of Bridge Inspection and Skid-Accident Reduction. Through Standard 612, funds are made available to train personnel and purchase needed equipment for these safety programs.

Through Standard 613, Department engineers have attended short training courses aimed at increasing their knowledge and their value to the Department. This standard also enables qualifying cities and towns to purchase pavement marking equipment,

traffic counters and warning regulatory signs for use on highways that are not on the Federal-Aid System.

RESEARCH & MATERIALS SECTION

The Research and Materials Division has its headquarters in Wellesley and is responsible for a wide variety of physical research projects and for complex materials testing.

MATERIALS TESTING SECTION

One of the Division's major components is the laboratory. For testing and detailed analysis purposes, this is divided into four units, as noted:

1. Bituminous: quality control of asphalt and bituminous concrete mixes, and testing and evaluation of new products.
2. Chemical: paint, chlorides, pesticides, adhesives and many other products are analyzed.
3. Concrete: Portland cement and concrete are tested, as well as reinforcing steel, brick, pipe and fencing materials.
4. Soils: earth materials - gravel, sand, peat, loam, etc.- are analyzed.

BITUMINOUS UNIT

The Bituminous Unit's test procedures and equipment, as in the past years, met the requirements of the AASHTO Materials Reference Laboratory periodic inspection. Due to the lack of sufficient personnel, the amount of testing had to be curtailed to a "spot check" method which enabled us to test over 1000 samples during the past fiscal year.

CONCRETE UNIT

The total number of samples tested in the 1974-75 fiscal year was 6,000. This represents a decrease in previous years but the complexity of the tests has increased the time required in the testing of many of the items.

CHEMICAL UNIT

The total number of samples tested by this unit in the past fiscal year was approximately 1,700. In addition, a bridge deck evaluation and inspection unit operates out of the Chemical Unit. It's responsibilities consist of training and assisting district teams in the areas of bridge deck corrosion, chloride content and membrane evaluation.

SOILS UNIT

Samples tested for Department and related organizations amount to about 600. This unit follows AASHTO Test Procedures to make sure that the Department receives specification materials for its highway construction and maintenance projects.

FIELD MATERIALS CONTROL SECTION

The Field Materials Control Section has the responsibility for the monitoring of the plants which manufacture products used in highway building. There are more than two hundred bituminous concrete and cement concrete in the State which, at one time or another, service Department projects. Their manufacturing

equipment techniques and controls must be approved by this Unit.

All other manufacturing plants, such as steel, prestressed concrete, pipe, catch basin and manhole block companies must also be inspected and their products approved on a regular basis.

In addition to their plant monitoring, the Unit is responsible for all progress record sampling on construction projects (188 of them in 1975), and is also charged with detailed review of materials documentation on these projects.

SOILS AND FOUNDATION SECTION

TEST BORINGS AND SEISMIC SURVEY

Two advertised contracts were done in Fiscal 1975, both on Route I-190, one a design study in Worcester-W. Boylston and the other a pilot program in the towns of W. Boylston, Sterling and Holden. There were approximately 90 borings on the Route I-190 interchange and 55 on the pilot study.

The Department's two open-end boring contracts had twenty-three projects, Districts 1,2 and 3 had 10 projects and District 4 thru 8 had 13 projects.

The Department's test boring crew had 15 projects in Fiscal 1975. District 1,2 and 3 had 6 projects and Districts 4 and 8 had 9 projects. There was one seismic survey in the City of Haverhill completed in 1975 for the Solid Waste Bureau.

Design Bearing Ratio was obtained for 8 projects throughout the State. Sub-grade materials were tested by the California Bearing Ratio Method to obtain a Design Bearing Ratio which is used by the Pavement Design Engineer to determine the pavement requirements for the Department's layered pavement design.

Some of the projects were of considerable length, such as the Mid-Cape Highway Project which was some 29 miles and the I-195 project from the Rhode Island line to the Braga Bridge, some 11 miles \pm .

SOILS ENGINEERING, RESEARCH AND FIELD INSTRUMENTATION

This unit continues to review the technical aspects of all soil reports submitted for proposed Department work to ascertain that the designs and construction methods are in the best interest of the Department. This often involves a site visit, and where special problems occur, is followed up by construction inspection.

This unit, being the Department's Technical Representative on continuing cooperative soil related research projects, reviews the progress of such projects and has continuous communications with the researchers.

MATERIALS SECTION

Approximately 45 construction projects were visited by the Embankment and Soils Field Control Engineer to check on material incorporated in construction embankments. The Nuclear Density

Gauge continues to be a valuable piece of equipment in determining density and moisture content for soil as well as for bituminous concrete. With the introduction of manufactured crushed stone and dense graded crushed stone for sub-base, the Nuclear Density Gauge had become an invaluable piece of equipment to measure density and compactive effort.

SKID TESTING

During the 1975 fiscal year our Skid Testing program was continued in three separate phases.

First, an inventory program was set up to test and catalog the entire state highway system, with the interstate highway system receiving first priority to be followed by the primary and secondary roadways. A total of 750 lane miles of interstate highways were tested. This constitutes approximately 45% of the entire interstate system (not including the Massachusetts Turnpike).

Second, a research program entitled "Effectiveness of Alternate Skid Reduction Measures" was continued in conjunction with Midwest Research Institute of Kansas City, Missouri, and in cooperation with the Federal Highway Administration. The project consisted of a before-and-after study of thirty highway sections in Massachusetts to determine the relationship between accident rate and skid number. A total of 375 lane miles of primary and interstate highways were tested. A complete report on the first

phase was compiled and distributed to the appropriate agencies. Phase two of this program was started during this fiscal year, and is due to be completed during the following year.

The third phase of our skid testing program consisted of carrying out a continuous program of testing high wet accident areas on request. Shortly after construction, the skid resistance of new and/or experimental pavements wherever placed are measured with periodic remeasuring in order to monitor the change in skid resistance and to evaluate the mix designs, wearing qualities of various aggregates, etc. Approximately 200 lane miles of primary highways were tested on this basis.

RESEARCH UNIT

During the past fiscal year the Research Unit was responsible for the supervision of eleven studies under the Highway Research Program which is financed in part by the Federal Highway Administration. In addition to these we continued three other studies. Two of the studies were on a 50-50 basis with the U.S. Geological Survey; one of these is the Geologic study and the other is the Water Resources study. The Joint Highway Research Study in collaboration with the Massachusetts Institute of Technology was continued with financing entirely by the Massachusetts Department of Public Works.

The following is a list of the Highway Research Program studies which were active during fiscal 1975.

Study No.	Title	Research Agency
R5-5	Roadside Development	University of Massachusetts
R9-0	Hydrologic Study-Small Watersheds	U.S. Geological Survey
R12-2	Movement & Stability of Cuts & Fills	Massachusetts Institute of Technology
R12-7	Evaluation of Rapid Frost Susceptibility Test for Soils	Massachusetts Department of Public Works, Research & Materials Division
R18-0	Effects of Deicing Chemicals Upon Surface and Ground Water	U.S. Geological Survey, & Massachusetts Department of Public Works
R21-3	Reduction in Negative Skin Friction	Massachusetts Institute of Technology
R23-0	Behavior of Varved Clays in Civil Engineering Structures	Massachusetts Institute of Technology
R27-0	Surface Characteristics of Pavements	Massachusetts Department of Public Works, Research & Materials Division
R30-0	Evaluation of Bridge Patching Materials	Massachusetts Department of Public Works, Research & Materials Division

THIS SECTION IS RESPONSIBLE FOR THE CONTINUOUS, COMPREHENSIVE AND SYSTEMATIC REVIEW OF THE RECORDS, POLICIES AND PROCEDURES RELATING TO THE TECHNICAL OPERATIONS PERFORMED BY ORGANIZATIONS REPORTING TO THE CHIEF ENGINEER.

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I. MAJOR ACTIVITIES

A. Project Reviews

- 1) Construction Reviews - Engineering Teams from this Section conducted approximately one-hundred

and five (105) In-depth Reviews of active Highway and Bridge Construction projects throughout the State. A circumspect review and audit of all records relating to documentation for pay quantities and control of materials & equipment incorporated into the project is conducted to assure that project is in compliance with Contract Specifications, Department Standard Operating Procedures and other controls; also to render assistance where required. This phase of the review is followed by a field inspection in company with the Resident Engineer; of work completed and in progress. Various construction operations underway are observed to assure that accepted practices and controls are being maintained by State personnel and the Contractor. Where applicable, check measurements are taken to ascertain conformance with Specifications. In addition, the Contractor's overall compliance with OSHA (Occupational Safety & Health Act) requirements are evaluated together with measures taken to provide protection to the traveling public. Detailed reports of these reviews are prepared together with any recommendations and submitted directly to the Chief Engineer, with copies distributed to Research & Materials Division, Construction Office, the respective District and to the Division Office of the Federal Highway Administration.

I. MAJOR ACTIVITIES (cont)

2. EEO Reviews - Equal Employment Opportunity Contract Pro-

vision compliance has been monitored through the Procedures & Records Engineer (as the designated EEO Coordinator for the Department) and the Section's EEO Unit (EEO Administrator and Assistants). This review procedure, like that of the Construction Reviews, is implemented throughout the duration of each Federal Aid Construction Project, and specifically included:

- a) 42 On-Site EEO Project Compliance Reviews
- b) 7 Joint FHWA Project Compliance Reviews
- c) 7 Home Office EEO Compliance Reviews
- d) 102 Preconstruction Conferences
- e) 23 Post Preconstruction Conferences

The reviews were conducted both independently and in conjunction with personnel of the Division and Regional Offices of the Federal Highway Administration. Reports and evaluations are submitted directly to the Chief Engineer, the District Office and to the Division Office of the Federal Highway Administration.

B. Statistical Reports - The Section has assumed the responsibility for compiling and processing the substantially increased work load of statistical reporting requirements of the Department, principally in the area of Civil Rights and EEO. Among these are the following:

1. PR-1391 - Contractor's Monthly EEO Reports
2. PR-1392 - Annual Summary of Contractor's Work Force for month of July (Statewide)
3. FHWA-1409 - Contractor's Quarterly Training Report (each trainee)
4. FHWA-1410 - Summary of all Trainees (Statewide)
5. Optional Form 66 - Office of Federal Contract Compliance-Monthly Manpower Utilization Report

I. MAJOR ACTIVITIES

B. Statistical Reports (cont)

6. Contracting Activity Report - Monthly listing of projects advertised and awarded in Bid Condition Areas. Assignment of OFCC Number (e.g. BO-DOT(H)-7-74-006; NB-DOT(H)-7-74-007)
7. Post Contract Implementation Report - Summary of all Optional Form 66 Reports for each Contractor, Project and Trade utilized including subcontractors.
8. DOT Quarterly Report - A report submitted to FHWA Division Engineer on Project and/or Home Office Reviews conducted during preceding quarter and a schedule of reviews for next quarter.
9. Youth Opportunity Program - Again, the Section prepared and distributed correspondence soliciting Contractors and Consultants to provide employment for disadvantaged youths in the Highway Industry. As requested by the FHWA, a final report was submitted listing certain statistical information secured from a survey of participating companies conducted by this Section.

C. Civil Rights - Title VI Guidelines - The overall responsibility for initiating and monitoring Title VI (1964 Civil Rights Act as amended) activities has been assigned to the Procedures & Records Engineer and the Section. Guidelines were developed and submitted to the FHWA to provide for implementation of procedures to assure compliance by the various Divisions and Sections of the Department for which Federal Financial Assistance is received. The Section is responsible for monitoring the compliance with these Guidelines in conjunction with the designated Civil Rights Officer in each of the nine (9) Federal Aid Program Areas. Responsibility for submission of an annual summary report of compliance will be that of the Procedures & Records Section. Three (3) In-depth Reviews were conducted jointly with the Federal Highway Administration:

1. Planning
2. Research & Materials
3. Design

I. MAJOR ACTIVITIES

D. Standard Operating Procedures - Procedures & Records Section has continued to review all proposed new or revised Standard Operating Procedures concerning engineering or technical operations of the Department. Where necessary, investigations were conducted to provide clarification of procedures or enunciation of policy.

P&R Section representatives were on the Committee regarding proposed Reorganization of the Department and have been assigned the responsibility for review of all Standard Operating Procedures which will require changes due to proposed Reorganization.

E. Action Plan - During the first half of Fiscal '74, an engineer from this Section was assigned to full time work in the preparation of the Massachusetts Action Plan. Following the preparation, final printing and distribution of the Plan, a Section representative was assigned to prepare guidelines for implementation of the Plan in conjunction with the Federal Highway Administration.

II. SPECIAL ASSIGNMENTS

In several areas, this Section has been involved on a continuous basis for special assignments:

A. Personnel have investigated problem areas and resolved questions thus expediting Federal reimbursement.

B. Construction Safety - Occupational Safety & Health Act (OSHA) regulations are featured prominently in Construction Project Reviews and the Section has maintained close liaison with the Division of Industrial Safety, Massachusetts Department of Labor & Industries.

C. Construction Seminars - The Procedures & Records Engineer and other personnel of the Section participated in the annual meetings with field personnel in the Districts throughout the State.

III. LIAISON WITH OUTSIDE AGENCIES

A. Federal Highway Administration - In addition to formal contact with the FHWA Division Office, personnel of this Section have participated in Seminars and Workshops conducted at the Regional and National level.

B. AASHTO & AHONAS (NASHTO) - The Procedures & Records Engineer has been an active delegate to these organizations of State Highway Officials. The Section coordinated efforts to schedule the National Convention of AASHTO for Boston in 1976.

C. Other States - Acting as liaison for the Chief Engineer and Commissioner, this Section has prepared replies to general and specific inquiries from sister States.

D. Other Departments, Agencies - Via meetings and correspondence, the Section has maintained liaison with the Department of Labor & Industries; Department of Natural Resources; Massachusetts Commission Against Discrimination; and Division of Administration & Finance.

Notable efforts have been expended in behalf of the State Office of Minority Business Assistance. Of special note, was the preparation of Contract Special Provisions for 'Minority Subcontractors'.

E. Contractor Organizations - A productive relationship of mutual benefit has been maintained with CIM (Construction Industry of Massachusetts) and AGC (Associated General Contractors).

F. Unions - A cordial relationship with Highway Industry Trade Unions through meetings and correspondence has reduced much tension relative to Equal Employment Opportunity.

IV. LIAISON WITH OUTSIDE AGENCIES (cont)

G. Minority Organizations - Civil Rights and EEO duties have involved the Section with minority organizations throughout the State. The Section has developed, and is monitoring a Contract for Supportive Services for On-the-Job Trainees with the New Bedford Urban Coalition and extension of contract by means of a new contract. In addition, two (2) more Supportive Services Contracts have been executed with the Community Minority Cultural Center of Lynn and the Greater Lawrence Community Action Council, Inc., to provide services for On-the-Job Trainees in the North Shore Area.

H. Training - The Procedures & Records Engineer has been actively involved with development of a Department In-House Training Program.

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DATA PROCESSING SECTION

During the past year the data processing section has upgraded computer hardware from an IBM 370/145 with 256K memory to 512K. At the same time the disk storage capability was increased by converting from IBM 2319 drives to IBM 3340 drives to accommodate increased workloads both in-house and as service to other agencies. These increases were accomplished with no additional expenditure by taking advantage of fixed pricing plans and eliminating the additional billable charges which we were paying previously.

Remote terminal service is still being provided during the normal work day to all eight district offices, highway planning and the M.D.C. A high speed terminal has been installed at the office of the Central Transportation Planning Staff and another is proposed for the Water Pollution Control Board so that direct entry to our central facility from these groups is, or will be, provided on a continuing basis.

The payroll system has been partially revised during the year, so that paper checks with a stub showing deductions are now being used. A computer tape with the check issue information is provided to the bank to facilitate the reconciliation as checks are cashed.

Our plotter is in full use, providing plans, graphs and charts for our own department and also to various other agencies. The Traffic Signal Inventory is in partial operation with work progressing to make it a complete system.

Basic system design and equipment testing has been completed to provide an automatic system for the collection of fuel use data, replacing our current method which relies heavily on manual coding and data entry. The full system should be in operation very soon.

Computer use for the fiscal year, based on the main processing unit meter, totaled 2722.63 hours. The four-month total with 256 K memory and smaller disks totaled 1052 hours for an average of 263 hours a month. With new disks and 512 K main memory the total was 1670.63 hours or an average of 208.83 hours a month, with a greater work load. Actual wall clock time would be over 300 hours a month; in order to reach full capacity or about 700 hours a month it would be necessary to operate three shifts around the clock, seven days a week. This would require additional staffing.

DIVISION OF WATERWAYS

The Division of Waterways as specified under Chapter 821 of the Acts of 1963 is a separate Division within the Department of Public Works. Its duties the functions are separate from the Highway Division of the Department and are outlined in Chapter 91 of the General Laws. In addition to the duties and functions as outlined in Chapter 91 of the General Laws, the legislature by means of special legislative acts and resolves, authorizes and directs the Department of Public Works through its Division of Waterways to perform functions that are beyond the scope of Chapter 91.

A list of the chief functions and responsibilities of the Division of Waterways follows:

UNDER CHAPTER 91

1. The design and supervision of construction of shore protection, harbor improvement and development, stream clearance and flood control projects throughout the Commonwealth. Design is performed either with the Division's own staff or by consulting engineers. Supervision of construction is with our own staff.
2. Issues licenses for structures in certain rivers, tidewaters and great ponds; and permits for dredging. All licenses and permits are issued after a public hearing has been held.

3. Makes field inspections to see that work for which licenses or permits have been granted comply with plans.
4. In charge of great ponds (over 1300), Commonwealth tide lands, rights in land, flats, shore and tidewaters (over 1900 miles of tidal shore).
5. Acts as the coordinating agency for Federal harbor development and shore protection projects done on a co-operative basis (i.e., in some cases only fiscal co-operation and in other cases both fiscal and engineering cooperation).
6. In charge of the State Piers at Plymouth and New Bedford and Pilgrim Memorial Park in Plymouth (Plymouth Rock and surrounding area).
7. Leases Fall River and Gloucester State Piers. Makes certain repairs and reconstruction to said piers as authorized by Special legislation.

UNDER SPECIAL LEGISLATION

1. Acts as the contracting agent for the Public Access Board. As such represents the Commissioner of Public Works at meetings of the Board. Designs and supervises construction of public boat launching sites approved by the Public Access Board.
2. Acts as the contracting agent for the Department of Natural Resources for the design and construction of recreational facilities such as swimming pools and skating rinks outside the Metropolitan District Commission.

3. Under Chapter 595 of the Acts of 1970, the duties of the County Commissioners relative to the construction, supervision and maintenance of dams and reservoirs were transferred to the Commissioner of Public Works, who has assigned the duties to the Division of Waterways. The Division is receiving assistance from the Highway Districts, who have assigned personnel to make inspections and prepare reports.
4. The Division in cooperation with the Massachusetts Port Authority; the U.S. Coast Guard; U.S. Army Corps of Engineers; the Mass. Department of Public Health; the Attorney General's Office; and the Boston Harbor Committee on Pollution, is preparing a program aimed toward cleaning up navigational, health, and safety hazards in Boston Harbor and other coastal waters.
5. Under Chapter 870 of the Acts of 1970, a special fund was created to be known as the "the Harbors and Inland Waters Maintenance Fund."

The work to be done from the monies in this fund consists of the continuous maintenance, dredging, and cleaning of the harbors, inland waters and great ponds of the Commonwealth in order to protect the wetlands of the Commonwealth.

6. The Division of Waterways is the representative for the Commissioner on the following commissions and boards:

1. Water Resources Commission meets Monthly
2. Public Access Board meets Monthly
3. Connecticut River Flood Control Commission meets Quarterly
4. Thames River Flood Control Commission meets Bi-Annual
5. Merrimac River Flood Control Commission meets Bi-Annual

ANNUAL RIVERS AND HARBORS HEARING

At the Annual Division of Waterways Rivers and Harbors Hearing held April 24, 1975 the Division heard petitions from 57 municipalities for 141 proposed projects to be done under the provisions of Chapter 91 of the General Laws.

Sixteen (16) cities petitioned for 40 projects and forty-one (41) towns petitioned for 101 projects.

These projects will be scheduled for implementation on a priority basis as determined by the Commonwealth and the City or Town Officials.

The order of priority will depend on the availability of local and state funds and engineering resources.

WATER CONTROL STRUCTURE

Under the provisions of Chapter 91 of the General Laws and Chapter 727 of the Acts of 1970, the Department was authorized by the Legislature to cooperate with the Town of Wellfleet on a water control structure at Chequesset Neck Road over Herring River.

The Division directed Andrew Christo Consulting Engineers to prepare plans and specifications for the work consisting of a three barrel reinforced culvert for a water control structure, tide gates, sluice gate, concrete wingwalls, lumber sheeting, dike construction, slope and channel paving, grading, roadway construction and miscellaneous work.

The construction work was awarded to the low bidder Van D. Lambert Excavating, Inc. on February 13, 1974 and the project was completed April 14, 1975 at a total cost of \$239,770.00.

The Town of Wellfleet contributed 50% of the total cost.

SHORE PROTECTION PROJECT

Under the provisions of Chapter 91 of the General Laws and Chapter 822 of the Acts of 1973, the City of Quincy petitioned the Department for a Precast Concrete Block Seawall at Town River Bay from Palmer Street to Baker Beach.

Plans and specifications were prepared by the Division and the project was awarded to Ernest Minelli, Inc. on September 4, 1974.

LICENSE & PERMIT SECTION

The Division, during Fiscal 1975, held numerous public hearings for petitions under the provisions of Chapter 91, for structures in, over and under tidewaters, Great Ponds and certain streams and for excavation or dredging in same. As a result of these public hearings, approximately 130 licenses and ten (10) permits were granted. There has been a substantial reduction of licenses issued as a result of Environmental Assessment requirements of which about eighty (80) are now awaiting replies.

Approximately \$16,000.00 was received for fees for tide-water displacement and for privileges granted under licenses in the Commonwealth Tidelands.

The Division made four hundred (400) field inspections to see that work done complies with the license or permit and also on complaints of unlicensed work.

The Division, under the provisions of Chapter 130, Section 27A and of Chapter 131, Section 40 of the General Laws as revised by Chapter 818 Acts of 1974 (the so-called Jones and Hatch Acts), receives notices from persons planning to fill or dredge in coastal or inland waters. The Division's function is to determine what jurisdiction, if any, comes under the provisions of Chapter 91 of the General Laws. Approximately 400 to 500 such notices are received annually.

The Division has reviewed 59 Land Court Cases this year for the purpose of protecting the rights of the public in tidewaters and Great Ponds.

The work was started on November 11, 1974 and completed on May 15, 1975 at a total cost of \$38,856.80.

The City of Quincy contributed 50% of the total cost.

HARBOR IMPROVEMENTS-REMOVAL AND DISPOSAL OF EXISTING STRUCTURES

Under the provisions of Chapter 91 of the General Laws and Chapter 878 of the Acts of 1970, the Department was authorized by the Legislature to undertake a major Harbor and Inland Waters Improvement Program.

Under this program, in cooperation with the Department of Natural Resources, the Division completed a harbor improvement project at Gallops Island consisting of the removal and disposal of an existing timber pier, bulkhead, and removal and disposal of three (3) sunken barges.

Fairhaven Marine, Inc. began on this project January 23, 1975 and completed the Contract on May 21, 1975 at a total cost of \$84,500.00.

BUREAU OF SOLID WASTE DISPOSAL

Fiscal year 1975 was a major milestone for the Bureau of Solid Waste Disposal. The reorganization of state government marked Fiscal 1975 as the final year for the Bureau of Solid Waste Disposal in the Department of Public Works. Effective July 1, 1975, the Bureau will be in the Department of Environmental Affairs.

It is appropriate in our last DPW annual report to take specific notice of and express the Bureau's appreciation for the assistance provided by the numerous individuals and offices in the DPW that have worked with the Bureau providing such indispensable support as budget and fiscal management, engineering and technical support, and the full range of administrative support including mail, motor pool, legislation, contracts, policy, personnel, etc.

It is also appropriate to note that while our need for direct administrative support from DPW no longer exists, the need for continuing cooperation between Environmental Management and Public Works is an important part of the state solid waste program.

During Fiscal year 1975 the primary emphasis of the activities of the Bureau was the implementation of a statewide network of regional solid waste disposal resource recovery systems. The first effort in the implementation of this program is ongoing in the Northeastern sector of Massachusetts, centered in the

Merrimack Valley. The Bureau is working with a group of municipalities through a voluntary participation arrangement to plan and implement a long term solution to the area's solid waste problems. The Bureau has assisted local officials in the evaluation of facility sites, the design of regional approaches and the solicitation and selection of proposals from a private industrial firm to design, construct and operate a solid waste disposal resource recovery facility. Such a facility would be capable of processing municipal solid waste from a large number of municipalities in the region and recovering valuable energy and material by-products from the wastes.

Work has also commenced in the organization of a second regional system in the west suburban area of Boston. A number of municipalities in this area have expressed a willingness to work with the Bureau to implement a regional system. It is anticipated that implementation of similar regional systems will be undertaken in the near future in areas such as Worcester County, the Connecticut Valley area, Southeastern Massachusetts and other areas.

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